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Understanding Psychological implications affecting children of differing Body Mass Index

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Doctorate in Clinical Psychology

The University of Edinburgh

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DClinPsychol. Declaration of own work

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- Given the sources of all pictures, data etc. that are not my own ☒
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Additionally, for SSR and Thesis submissions:

- Received ethical approval from an approved external body (e.g. NHS Research Ethics Committee) and registered this application and confirmation of approval with the University of Edinburgh's School of Health's ethical committee ☒

Signature

Date

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For my family.

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Overview of Thesis

The thesis follows the portfolio format and is completed in part-fulfilment of the degree of DClinPsychol at the University of Edinburgh

An overall abstract provides a summary of the thesis portfolio including aims, findings and conclusions for both the Systematic Review and the Journal Article.

Chapter One is a Systematic Review investigating the relationship childhood psychological functioning in overweight and obese children and parental mental health. This was written in accordance with the author guidelines for the International Journal of Paediatric Obesity.

Chapter Two provides the overall thesis aims and hypotheses for the empirical studies.

Chapter Three is a Journal Article which examines relationships between differing Body Mass Indexes, Self-Esteem, Resilience and Quality of life. This chapter is written in accordance with the author guidelines for the Clinical Child Psychology and Psychiatry.

Chapter Four is the final chapter and provides additional information regarding the methodology of the study and is referenced according to the British Psychological Society as recommended by University of Edinburgh

The final sections of the thesis contain the overall references written according to the British Psychological Society and following this a number of appendices which are referred to throughout the portfolio.

The page numbers are written in accordance with the overall thesis for ease of clarity and not as per journal guidelines. These would not be used in submission to a journal.

Overall Thesis Abstract

Objectives: This thesis aims to further our understanding in relation to childhood obesity and associated psychological difficulties.

Design: The systematic review aimed to investigate the relationship between childhood psychological functioning in overweight and obese children and parental mental health difficulties. The empirical study aimed to examine possible relationships between Body Mass Index (BMI), self-esteem, quality of life and resilience, in order to determine any factors which may protect against the negative psychological consequences of obesity.

Methods: A systematic review was completed using a comprehensive literature search of relevant databases to identify studies examining the relationship between childhood psychological functioning in children who were deemed overweight or obese and parental mental health difficulties. In the empirical study children of a variety of differing Body Mass Indexes (BMI) were asked to complete measures of quality of life, resilience and self-esteem. Correlation analyses were carried out to determine any relationships between BMI, quality of life, resilience and self-esteem. Moderation analyses were then completed to examine whether resilience moderates the relationship between BMI and quality of life or between BMI and self-esteem.

Results: Ten studies met inclusion criteria for the systematic review. Although the reviews appeared to indicate a significant relationship between parental mental health and childhood psychological functioning, the studies were predominantly of average or low methodological quality, weakening any conclusions drawn. Results of the empirical study indicated significant correlations between resilience and quality of life and resilience and self-esteem. BMI was not found to significantly correlate with any other factors. Further moderation analyses indicated no moderating effect for resilience. The lack of association between BMI and either quality of life or self-esteem may in part be because most children who took part were of normal weight.

Conclusions: Interventions targeting childhood overweight/obesity and their psychological effects may need to take into account wider psychosocial factors including parenting and positive factors which may protect against the negative psychological effects of obesity. However, further research is needed, particularly in relation to resilience.

Chapter One: Systematic Review

Investigating the relationship between childhood psychological functioning and parental mental health in overweight and obese children.

Short title: Childhood psychological functioning in overweight/obese children and parental mental health.

Review Article

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Professor Kevin Power, NHS Tayside

Dr Paul Graham Morris, University of Edinburgh

Word Counts: Abstract 185

Manuscript: 6694

(References: 52, Tables: 2, Figures: 1)

Conflict of interest: There were no conflicts of interest in the current study.

Written in accordance with International Journal of Paediatric Obesity (see appendix 1 for author guidelines)

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Abstract

The review aimed to investigate the relationship between childhood psychological functioning and parental mental health in overweight and obese children. Studies assessing parental mental health difficulties, childhood psychological functioning in overweight and obese children and the relationship between these were identified by systematically searching through electronic databases and manual searches of relevant journals, reference lists and by contacting prominent authors in the area. Ten studies were included in this review. Five of the studies found a significant relationship between maternal mental health difficulties and childhood psychological distress. The remaining five assessed both mothers and fathers and again found a significant relationship between parental mental health and childhood distress. The reviewed papers suggest a significant relationship between parental mental health and childhood psychological functioning, particularly in the case of mothers. Methodological difficulties limit the conclusions which can be drawn from the review. Therefore, while available evidence suggests a link between childhood psychological functioning in obese and overweight children and parental mental health issues, further research is needed which addresses the identified methodological weakness, for example the weaknesses in the studies' statistical analyses, before firmer conclusions and comparisons can be drawn.

Keyword: BMI, Child, Weight, Obese, Overweight, Parenting, Psychiatric, Psychological, Psychopathology.

Introduction

Obesity levels are a growing concern worldwide. It was estimated that by 2008 1.46 billion adults across the world were overweight and that an additional 502 million were obese (1). For children, 170 million were classified as overweight or obese (1). In Scotland alone research indicates 14% of children aged 2-15 years were found to be obese and that three out of every ten children were overweight or obese (2), defined as having a BMI greater than or equal to 85th Centile (3). The psychological implications of childhood obesity are becoming the focus of research with childhood obesity linked to a variety of health conditions including diabetes, cardiovascular conditions and leading to weight issues in adulthood (4). The psychological implications of childhood obesity have only more recently become the focus of research. Childhood obesity has been linked to depression (5), low self-esteem (6) and stigma. In trying to understand obesity in children, research is beginning to take account of the wider family psychosocial context, in particular parental psychopathology.

The effects of parental mental health have long since been established. One in four adults in the UK experience mental health problems with around 25% of these being parents (7). Living who has a parent with a mental health difficulty can have genetic, environmental and psychological consequences for the child. It is out-with the scope of this paper to discuss genetic links but estimates have suggested bi-polar disorder to have 80%, schizophrenia 75% and depression 34-48% heritability(8).

Children living suffering from a parent with mental illness can also be at risk environmentally. Children who are not developing in line with their age related norms for

head circumference, weight, height and psychosocial development are classed as failing to thrive (9). A variety of studies have linked parental psychopathology with failure to thrive suggesting mothers of these infants are depressed and often have low self-esteem, affecting their coping abilities (e.g.10). 22% of children with non-organic failure to thrive were found to have mothers suffering from post natal depression compared with only 11.5% without (11), although it is not always clear whether parental psychopathology precedes or results from failure to thrive (9). However, a variety of studies have failed to replicate the link between parental psychopathology and failure to thrive (e.g. 9, 12).

Parental mental health can have substantial effects on parenting although not always the case (13). Parental psychopathology can have a direct impact on the child such as being included in a parental delusion or being subjected to the irrational behaviour of a parent (13). Disruptions to parenting can also be seen in relation to responsivity to a child. Parents of older children may struggle to set limits leading to behavioural issues (13) or adolescent depression (14). In younger infants however parental psychopathology can lead to significant disruptions to attachment. Attachment theory refers to the bond that a child develops to their primary care-giver, usually the mother, which can have substantial effects on a variety of aspects for example cognitive development (15). When a parent responds appropriately and is attuned to the needs of the child a sense of self-identity and security is developed (16), together with appropriate coping strategies and stress responses (17). However children of parents with psychopathology may face inconsistent or neglectful parenting (18), which can lead to disruptions to cognitive development (13).

Therefore, typically developing children living with a parent with a mental health difficulty are at risk of a number of physical and psychological consequences. Living with a parent with mental illness can also have specific implications for children who are overweight or obese. The link between psychological difficulties and obesity is believed to be bi-directional. For example a recent study (19) suggested a bi-directional causal model between obesity and depression where each of the conditions contributes to the other. Research has indicated parental psychopathology is more related to childhood psychological functioning than a child's weight (20). It is therefore essential that parental mental health is considered. Children living with a parent with mental health difficulties may be at risk of structural and functional vulnerabilities in relation to their weight and psychological functioning. Indeed maternal distress has been found to increase the risk of a child being classified as obese, more so than the mothers weight (21).

The disruption to attachment for a child whose parent has a mental health difficulty has already been discussed. However this can have specific implications for the structural vulnerabilities of an obese child. A child's attachment behaviour and ability to regulate their emotions develop in the context of a secure attachment (22). A responsive parent acts to regulate the effects of the child's developing hypothalamic-pituitary-adrenal (HPA) axis functioning (23) by calming the child in the presence of stress allowing their cortisol levels to return to normal and ultimately how to regulate their own emotions (24). However in the presence of a parent who is unresponsive or inconsistent in their responses due to mental health difficulties, the child is likely to become stress vulnerable (25) leading to unusually high or low baseline levels of cortisol which can have long term effects (E.g. 26, 27). These changes in HPA functioning and cortisol levels can lead to poor emotional regulation in the child (28) and have been hypothesised to contribute to obesity (29), as they influence weight

regulation (30) sleep regulation and appetite, leading to a positive energy imbalance (31). Obesity in turn exacerbates dysregulated cortisol functioning (32) further compounding the difficulty. Therefore living with a parent with psychopathology may result in changes in the child's neuroendocrine system through disrupted attachment leading to poor mental health and increased obesity.

Parental psychopathology can also leave a child at risk of functional vulnerabilities. At a basic level a parent with a significant mental health problem may lack the ability to provide appropriate healthy food for a child (33). Both eating behaviours and responses to negative situations are also known to have a learned capacity, modelled by the parent and learned by the child (e.g. 34). Therefore a parent with mental health difficulties may be demonstrating unhealthy relationships with food, or unhealthy eating behaviours in the presence of the child (33). Eating is also a strategy which is known to be used to cope with negative emotions which have been found to develop in the context of parental psychopathology, with increased food consumption in response to stress (30). Therefore parental psychopathology is known to have significant effects on children and in particular children who are overweight or obese potentially affecting both their weight and to their mental health.

Research continues to grow regarding the psychological consequences of obesity. To date a variety of research has considered the role of parental mental health difficulties and its relationship to childhood psychological functioning in obese children (e.g.21 & 35). The research has examined this relationship using a range of methodologies from intervention studies (36) to cross-sectional studies (37). The variety and robustness of the measures used have also varied. In order to begin to draw any firm conclusions in relation to the research, it

is essential that the literature is examined systematically considering the quality and scientific rigour of each study.

Aims of the review

The aims of the systematic review were to investigate the relationship between childhood psychological functioning in children classified as overweight or obese and parental mental health. Specifically, to consider whether psychological functioning in children is negatively affected, in line with increased parental mental health difficulties. Whilst there is extensive research on this relationship in typically developing children there is no review which considers overweight/obese children specifically. Currently there is a gap in the research which potentially indicates that children who are obese and whose parents have mental health difficulties are even more at risk of experiencing their own psychological difficulties. It is necessary to establish this as it may have resultant implications for treatment of obesity. If a relationship is established it may be necessary for parents to be more involved in the treatment of the psychological effects of obesity.

Method

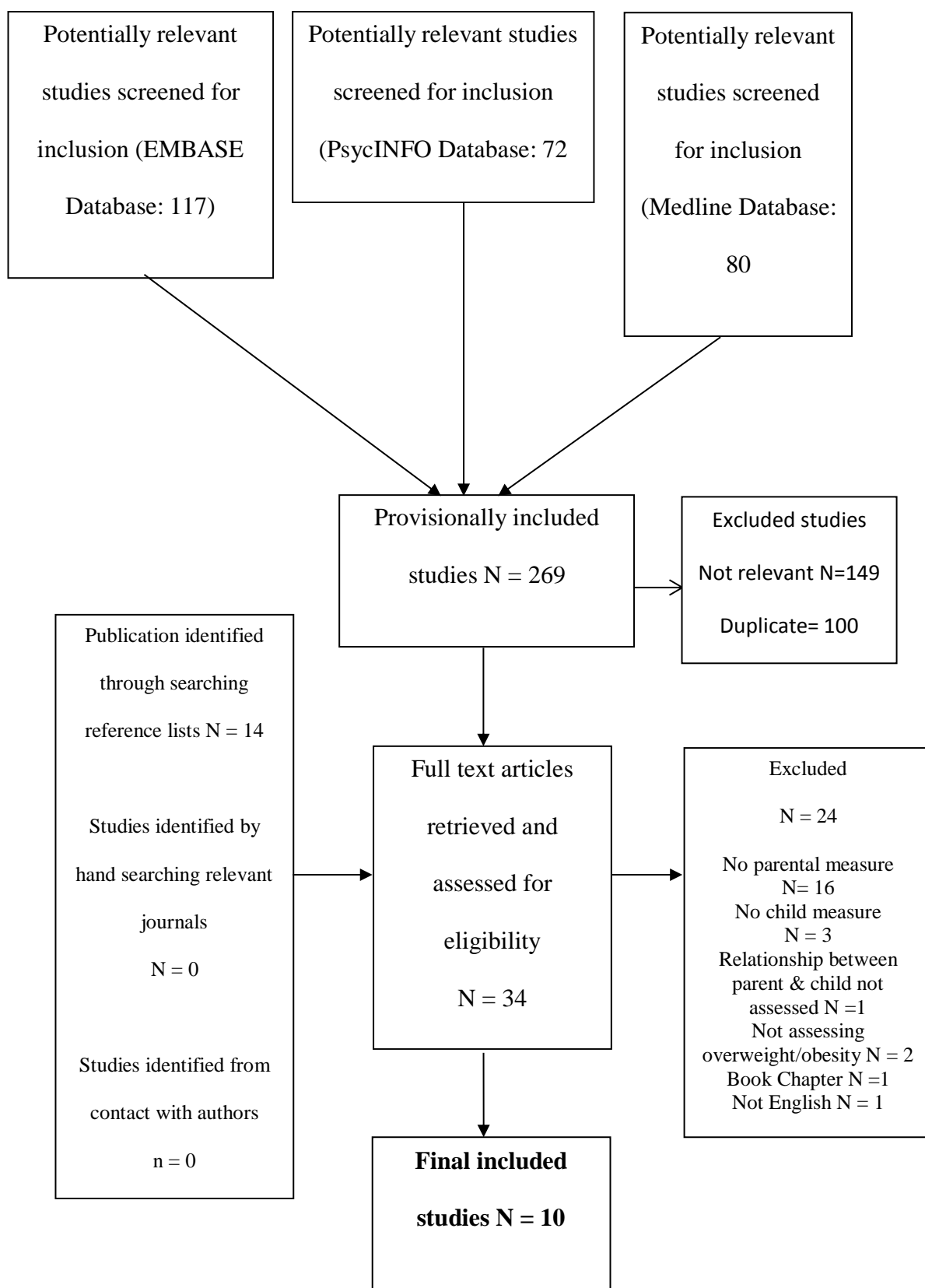
To ensure a similar systematic review had not already been conducted in this area, an initial literature search was conducted using The Cochrane Database of Abstracts of Reviews of Effects (DARE) in January 2013. No existing review was identified.

Search strategy

In January 2013 the following electronic databases were searched to identify possible papers for inclusion, EMBASE (1993-2013), PsychINFO (1993-2013) and Medline (1993-2013). Research was limited to the past twenty years to ensure that the identified papers were relevant. This is particularly the case given changes in patterns of obesity in children over recent years. Furthermore it was felt that generally the methodological rigour for papers from more than twenty years ago was not as high as it is currently. The following search string was used ‘obes\$’ OR ‘weight’ OR ‘body mass index’ OR ‘overweight’ AND ‘psychopathology’ OR ‘psychological distress’ OR ‘psychiatric distress’ OR ‘psychological symptom\$’ OR ‘psychiatric symptom\$’ AND ‘psychol\$ OR ‘mental health’ AND parent\$ OR ‘father’ or ‘mother’ AND ‘child\$’. Searches were limited to studies published in English language peer-review journals as translation of articles was outwith the scope of this research. Using the above search strategy 269 articles were retrieved (EMBASE: 117, PsychINFO: 72, Medline: 80). The titles and abstracts of all the returned articles were screened to determine their suitability using the above inclusion and exclusion criteria. At this stage 20 articles which appeared to meet the inclusion criteria were retrieved.

In an attempt to be as inclusive as possible and reduce the potential for publication bias the first author sought to contact authors whose names appeared most frequently in papers meeting criteria for the review. Attempts were made to contact six authors, one was uncontactable and one did not respond. The four who responded all advised that they did not have any further articles, either unpublished or in progress, which should be included within the review and none were carrying out research in this area at present. The Journals of Obesity Research and the International Journal of Obesity were hand searched as they were

the two most frequently occurring Journals in all articles screened for potential inclusion. The journals hand searched were between 1993 and 2013 (the same period as included in the electronic database search). No further articles were identified for inclusion. Finally the reference lists of all articles included within this review (n=10) were hand searched and 14 articles were retrieved for further screening. Of these, none met criteria for inclusion in the review.

Figure 1. Flowchart detailing literature search process.

Criteria for Inclusion and Exclusion

The following criteria were used to assess whether a study was eligible for inclusion within the systematic review: (a) The paper was written in English as it was outwith the scope of this review to have papers translated into English (b) The paper included children aged 5-18 years, (c) the paper included one or both parents, (d) the paper used a validated questionnaire of childhood psychological functioning, (e) the paper used a validated questionnaire of parental mental health difficulties, (f) the paper included children who are defined as overweight or obese according to their Body Mass Index, (g) the study explicitly examined the relationship between childhood psychological functioning and parental mental health, (h) the paper was published within the last 20 years (1993-2013). Due to limited resources, book chapters, dissertations and case studies were excluded from the review as were studies that included children with co-morbid health conditions which are known to affect psychological functioning (e.g. diabetes, although children with health conditions may be used as a comparative group). Studies focusing specifically on eating disorders rather than obesity were also excluded.

Quality review criteria

Guidelines which have been developed to appraise research are predominantly focused on studies using randomised control trial methodologies (38). Consequently much of the guidance is not relevant for the current review. Therefore based on the NICE and SIGN guidelines, methodological quality criteria were developed a priori by the authors. These were as follows:

- A) The study is based on a sound theoretical rationale from which the aims and hypotheses are clearly derived.
- B) The sample is representative of the overweight/obese child population.
- C) Recruitment procedures are clear to ensure that any recruitment bias could be considered.
- D) Inclusion/exclusion criteria are clearly defined ensuring that the sample is representative.
- E) Attrition rates are clear allowing the representativeness of the sample to be considered.
- F) Clear criteria have been used to define overweight/obesity which is based on standardised guidelines.
- G) The child measure of childhood psychological functioning is psychometrically robust.
- H) The measure of parental psychopathology is psychometrically robust.
- I) The questionnaire takes a triangulated approach ensuring the highest quality of information is gathered.
- J) The study includes assessments of mental health/psychological functioning of both parents.
- K) Appropriate statistical tests are used to allow conclusions about the relationships to be drawn.
- L) Statistical power of the study is addressed.
- M) Generalizability, limitations and implications are clearly discussed.

The 13 quality criteria were assessed using criteria similar to those recommended in the SIGN methodology guidance (38). Although many of the studies did not discuss the

psychometric properties of the questionnaires, higher ratings were given if the properties of the questionnaires were readily available elsewhere and the raters were able to determine the suitability of the questionnaire in relation to the current review. Each study was rated independently by both the first author and the second author using the following ratings: well-covered – 3 points, adequately addressed – 2 points, poorly addressed – 1 point², not applicable – 0 point. For further ease of clarity these ratings were operationalized giving exact details of the specifications to reach each of the ratings. These are provided in Appendix 2. For ease of comparison, an overall quality rating for each paper has been included where a paper is rated as high quality if more than 75% of the ratings awarded are assessed as 3 – well covered, average quality if between 50-74% are assessed as 3 and poor if less 50% are assessed as 3. However, the author acknowledges that not all of the criteria are weighted equally and indeed for the purposes of this review items F-J carry the most weight

There was good overall agreement between the raters with the ratings matching exactly for 80%. The raters differed by 1 point on 15% and by 2 points on 5%. Where discrepancies occurred these were discussed and an agreement reached. Following discussions co-rater concordance reached 100%.

² This was adapted from the SIGN guidelines as it was felt that those papers where an issue was poorly addressed were of a slightly higher methodological quality than those where issues were not addressed.

Results

Data extraction and synthesis

As the papers employed a variety of different methodologies, meta-analysis was not considered appropriate. Instead data from each paper which related to the key aspects of the systematic review was extracted and summarised. Whilst many of the studies examined further variables and completed further statistical analysis these were not relevant to the current review. They have therefore not been included. Each paper in turn was reviewed and data relevant to the research objectives was extracted. Each of the studies did not describe the information uniformly therefore the author summarised the information using descriptors most salient to the review. These included participants, measures, BMI data and key findings. These results are displayed in Table 1.

Table 1 : Findings from the included studies in alphabetical order

Author Year Country	Recruitment/ Sampling	Child sample	Parent sample	Child Measure	Parental Measure	Other Source Measure	Key Findings
Davis et al (39) 2011 USA	Media announcements Self-referral Information gathered at first appointment	N=44 parent-child dyads 45% male 55% female 83% children reported by parent to be overweight or very overweight Average age 9.93 years	N=44 parent Approx 93% female No BMI details given No age details given	CDI CBCL (PC) CRRIC	BDI FAD	N/A	Child Functioning: No specific details given Parental Functioning: 33% parents displayed a depression score ≥ 10 – clinical cut-off for depression Relationship: 33 % parents clinically depressed, when combined with child depression & family & physical activity were significant predictors of depression. When combined with child depression, family functioning and visits to fast food restaurant 44% of variability was predicted.
Decaluwe et al (40) 2006 Belgium	Participants recruited from in- patient and outpatient weight management clinic. No further information re referral	N=196 40% male 60% female BMI > 95 th Centile Mean BMI 31.2 (SD = 5.3) 10-16 years old Mean 12.7 (SD 1.8)	162 mothers 131 fathers 125 both parents completed Mother BMI 18.4-48.8 Father BMI 17.3-49.0 Mothers (40.4 SD 5.0) years Fathers (43.2 SD = 6.1) years	CBCL (PC) ChEDE	SCL-90	N/A	Child Functioning: Children exceeding clinical cut-off for problem behaviour between 41.4-53.1% Parental Functioning: Parental psychopathology 59.6% for male and 35.7% for females Relationship: Maternal & paternal psychopathology positively associated with internalising and externalising problems in children. Evidence found for mediating effect of ineffective parenting on child's psychological adjustment. Children's problem behaviour most associated with psychopathology in mother.

Author Year Country	Recruitment/ Sampling	Child sample	Parent sample	Child Measure	Parental Measure	Other Source Measure	Key Findings
Epstein et al (20) 1994 USA	<p>Families recruited to intervention via public service announcements in media & referrals from paediatricians and school nurses.</p> <p>No further information re self-referral or referred.</p> <p>Data gathered at screening session for intervention.</p>	<p>45 parent/child dyads 69% sample female</p> <p>Average weight 32.4% - 61.2% overweight</p> <p>10.2+/- (1.1 SD) yrs No information re boy/girl split</p>	<p>45 Parent/child dyads (no further info given)</p> <p>Mothers: 6.9% underweight - 90.3% overweight (21.0 +/- 25.2)</p> <p>Fathers: 6.0% Underweight - 95.9% Overweight (27.2 +/- 22.2)</p> <p>Mothers 37.3+/- 4.7 yrs Fathers 41.9 +/- 5.7 yrs</p>	CBCL (PC)	CMI (both parents) SES	N/A	<p>Child Functioning: Majority of obese children fell within normal range of CBCL scores with 80% having no elevations in any scale.</p> <p>11% had elevated social problems scores.</p> <p>Parental Functioning: 4% of fathers & 11% of mothers exceeded clinical cut-off scores for CMI.</p> <p>Relationship: Path analysis for 0-6month change showed the influence of mother and father psychiatric symptoms and child age on child anxiety/depression that influenced child % overweight accounted for 41% of the shared variance.</p> <p>Path analysis for follow up change showed mother and father psychiatric symptoms influenced child and social problems at first stage, and child and social problems influenced child % overweight change accounting for 68.5% of the shared variance.</p> <p>Concluded that parent and child problems can have an influence on short and long term success of obese children in family based behavioural treatment programmes.</p>

Author Year Country	Recruitment/ Sampling	Child sample	Parent sample	Child Measure	Parental Measure	Other Source Measure	Key Findings
Epstein et al (41) 1994 USA	Families recruited to weight management intervention via public service announcements in media & referrals from paediatricians and school nurses. No further information re self-referral or referred. Data gathered at screening session for intervention.	59 families 34% male 66% female Average child 33.5% - 64.1% overweight Age 10.2 +/- 1.1 years old	59 Families (no other details given) Mothers: 21.7% underweight – 132.1% overweight (21.5 +/- 28.9) Fathers; 6% underweight – 95.9% overweight (28.6 +/- 21.0) Mothers 38.4 +/- 4.1 years Fathers 42.4 +/- 6.6 years	CBCL (PC)	CMI	N/A	Child functioning: Majority of obese children fell within normal range of CBCL with 71% having no elevation in any score. 10 children had elevated scores in 1 scale, 3 in 2 scales, 2 in 7 & 8 scales respectively. Anxiety/depression affected 15% of males Social problems 20% of males and 12.8% females Parental functioning: 6.7% fathers & 10% of mothers exceeding the clinical cut-off scores for emotional disturbances. Relationship: Multiple linear regression showed parental psychiatric symptoms were related to child psychiatric problems for 6/8 problem behaviour scales. Child obesity made no independent contribution to child psychological functioning.

Author Year Country	Recruitment/ Sampling	Child sample	Parent sample	Child Measure	Parental Measure	Other Source Measure	Key Findings
Epstein et al (35) 1996 USA	Families recruited to intervention via public service announcements in media & referrals from paediatricians and school nurses. No further information re self-referral or referred. Data gathered at screening session	2 groups N=92 N=60 39% male 61% female Average child 44.7 – 91.7% overweight 10. +/- 1.3 yrs	Mothers N=92 N=60 8.1% underweight - 159.6% overweight 39.2 +/- 5 years	CBCL (MC)	Group 1 = CMI BDI, BULIT, IIP Group 2= SCL-90 BES	N/A	Child Functioning: Combined sample 58% of males & 44% of females met clinical criteria on at least one CBCL. Social Problem solving most prevalent. Parental Functioning: Combined sample 27.6% of all mothers exceeded clinical cut-offs on either CMI or SCL-90. Relationship: Child obesity did not account for variance in psychosocial problems beyond that accounted for by maternal psychiatric symptoms. Maternal psychiatric symptoms are more strongly related to psychological problems in moderately obese children seeking treatment than weight variables.
Goldschmidt et al (37) 2012 USA	Recruitment to RCT via media outlets, community organisations & paediatric clinics. No further information about referral procedures given. Data gathered at initial appointment	201 overweight children 36% male 64% female 20-100% above median BMI for age & sex 7-12 years old Mean age 9.8 (1.3)	201 parents No further details give At least one parent BMI>/25) No age details given	CBCL (PC – Social problem subscale) SSRS (PC) ChEDE (Child) LSDS (CHILD)	BSI EDE-Q	N/A	Child Functioning: 35.3% of children categorised as high and 64.7% categorised as low in social problems based on clinical cut-off scores on CBCL (PC). Children categorised into high N=71 or low in social problem based on clinical cut off score of 65. Parental Functioning: No specific details provided Relationship: High children greater ED psychopathology & lower self-worth as well as range of interpersonal difficulties compared with Low children. Parents of high children reported greater levels of their own general psychopathology compared with parents of low children. Parental psychopathology significantly added to predication of social problems in full sample beyond child sex & Z-BMI.

Author Year Country	Recruitment/ Sampling	Child sample	Parent sample	Child Measure	Parental Measure	Other Source Measure	Key Findings
Isnard et al (42) 2010 France	<p>Participants already taking part in inpatient residential treatment weight loss programme.</p> <p>Participants seeking treatment although no further details about referral given.</p> <p>Assessment completed for current study at beginning of weight loss programme</p>	<p>N= 115 adolescents 31% male 69% female</p> <p>>97th Centile BMI z-scores 4.32 (± 0.78)</p> <p>12-17 years Mean age 14.2 (+/- 1.2) years</p>	<p>115 mothers 96 fathers</p> <p>No BMI details given</p> <p>No age details given</p>	<p>BITE BDI STAIC</p>	<p>GHQ BITE</p>	<p>MADRS (CR) BSA (CR)</p>	<p>Child Functioning: 27% rated for clinical depression on BDI (CC) 37% rated positively for anxiety on STAIC (CC)</p> <p>6% clinically significant scores on MADRS (CR) 17% clinically significant scores on BSA (CR)</p> <p>Parental Functioning: 50% mothers GHQ score above clinical cut-off 33.33% fathers above clinical cut-off</p> <p>Relationship: Psychopathological maladjustment & bulimic symptoms in obese adolescents significantly associated with maternal psychopathological disturbances especial anxiety & somatisation in mother.</p> <p>Maternal not paternal psychopathology strongly associated with existence of psychopathological symptoms in obese adolescents.</p> <p>The more emotionally disturbed the mothers the greater the severity of depression and anxiety in obese adolescents.</p>

Author Year Country	Recruitment/ Sampling	Child Sample	Parent Sample	Child Measure	Parental Measure	Other Source Measure	Key Findings
Myers et al (36) 1998 USA	Participants taking part in family based weight – control programme. No information regarding means of referral. Information gathered at baseline & 1 year follow-up.	116 No further information given Average child 44.3-76.7% overweight at baseline 20.6 – 60.7% overweight at 1 year follow up 8-12 years old	116 mothers No further information given Mean weight 9.4 – 64.2% overweight at baseline Mean weight 0.7- 51% overweight at 1yr follow up No age details given	CBCL (PC)	Group 1 – CMI Group2 SCL-90	N/A	<p>Child Functioning: 29% of children met criteria on at least 1 CBCL behaviour problem subscale (as measured at baseline).</p> <p>Most prevalent problems were internalising (24%) and social problems (21%) (as measured at baseline).</p> <p>Only 13% met criteria on at least 1 CBCL behaviour problem (as measure at 1 year follow-up).</p> <p>Parental Functioning: 17% of group one mothers and 18% of group two mothers met clinical cut-offs (as measured at baseline).</p> <p>No significant differences for group one mothers (as measured at 1 year follow up).</p> <p>Percentages of group two mothers scoring in clinical range on Global Severity Index and Interpersonal sensitivity symptom dimension significantly reduced (as measure at 1 year follow up).</p> <p>Relationship: Significant improvements observed in child % overweight (-20.1%), and child and maternal psychopathology. Improved maternal psychopathology accounted for significant amount of variance in improvements in CBCL total problems subscales and internalising and externalising problem subscales.</p>

Author Year Country	Recruitment/ Sampling	Child sample	Parent sample	Child Measure	Parental Measure	Other Source Measure	Key Findings
Villa et al (43) 2004 France	Participants recruited from Paediatric Dietetic department over 1 year period. Subjects asked to take part in the study by their clinician at 1 st appointment and data gathered if agreed.	N= 155 obese children (without diabetes) 37% male 63% female BMI z-scores ranged from +2 to +14 (BMI mean z-score +6.1 +/- 2.2) Aged 5-17 years Mean age 11.3 (+/- 2.5) N=171 Children with insulin dependent diabetes comparison group 49% male 51% female BMI z-score +0.4 +/-0.9	Mothers Fathers No information re male/female split Mothers mean BMI 26.8 ± 6.3 Fathers mean BMI 26.7 ±4.1 No age details given	STAIC CDI CBCL (PC)	GHQ	Clinician K-SADS (CR)	<p>Child Functioning: 50% of children who completed questionnaires identified psychiatric problems in self-reported scales.</p> <p>Parental report identified 50% of children as having psychiatric problems.</p> <p>58% of obese children with at least 1 DSM-IV psychiatric diagnosis (CR).</p> <p>32% had at least 1 DSM-IV anxiety disorder (CR).</p> <p>12% had an affective disorder (CR).</p> <p>16% had a disruptive disorder (CR).</p> <p>Parental Functioning: No specific details of parental functioning given.</p> <p>Relationship: Higher frequency of psychological difficulties in mothers GHQ-28, higher the symptom measures in children.</p> <p>DSM-IV diagnosis of affective disorder in obese children was associated with higher scores on maternal psychopathology.</p> <p>Psychological disorders were particularly pronounced in those obese children whose parents scored within the clinical range on the GHQ.</p> <p>Increased GHQ score = Increased symptoms in children.</p> <p>No correlation between severity of obesity in child or his/her parents & frequency of psychiatric disorders.</p> <p>Compared with diabetic children obese children displayed significantly higher internalised and externalised questionnaire scores and poorer social skills.</p>

Author Year Country	Recruitment/ Sampling	Child sample	Parent sample	Child Measure	Parental Measure	Other Source Measure	Key Findings
Zeller et al (21) 2004 USA	Participants recruited from paediatric interdisciplinary weight management clinic. Physician referral. Data gathered (with families consent) as part of intake interview to weight management programme.	121 children 38% male 62% female (54.5% white, 45.4% black) BMI $\geq 95^{\text{th}}$ percentile for age & sex. Children grouped into 8-11 years, N=62 & 12-17 years N=59).	121 mothers No further information given BMI 34.9+/- 10.9 (SD) No age details given	BASC (CR) BASC (PR)	SCL-90 GSI	N/A	Child Functioning: Psychological adjustment of obese children and adolescents not characterised by universally high levels of maladaptive behaviour or problematic psychological functioning. 29% obese children & 37% obese adolescents self-reported some degree of psychological maladjustment. 66% of obese children's mothers & 69% obese adolescent's mothers reported a degree of psychological maladjustment in their child. Parental Functioning: Mean GSI and SCL-90 scores for mothers were within the average range. 41% of mothers of child participants & 56% of mothers of adolescent participants reported clinically significant psychological distress. Relationship: Youth self-report & mother reported adolescent psychological difficulties most strongly associated with mother's psychological distress and /or family socioeconomic status rather than youth characteristics e.g. % overweight).

BMI, Body Mass Index, CBCL, child behaviour checklist, PC, parent completion, CC, child completion, CR, clinician rated, BITE, Bulimic Investigatory Test Edinburgh, BDI, Beck Depression Inventory, STAIC, The State-Trait Anxiety Inventory Child, GHQ, General Health Questionnaire, BASC, Behaviour Assessment System for Children, SCL-90, Symptoms Checklist 90-Revised. K-SADS-R, Kiddie Schedule for Affective Disorders and Schizophrenia, CMI, Cornell Medical Index, CDI, Child Depression Inventory, CRRIC, Cardiovascular Risks Reduction in Children Questionnaire, FAD, Family Assessment Device (FAD), BULIT, Bulimia Test, BES, Binge Eating Scale, IIP, interpersonal Problems, GSI, General Symptomatic Index, SSRS, Social Skills Rating System, EDE-Q, Eating Disorder Examination, ED, Eating Disorder, GSI, Global Severity Index.

Table 2 : Quality review of papers
Quality Criteria factors

	Rationale	Recruitment and sampling				Measures					Statistics		Generalizability	Overall
	A	B	C	D	E	F	G	H	I	J	K	L	M	Overall
Isnard et al. 2010 (42)	3	1	3	3	3	3	3	3	3	3	3	1	3	High
Villa et al. 2004 (43)	3	1	2	3	3	3	3	3	3	3	3	1	3	High
Zeller et al. 2004 (21)	3	1	3	2	3	3	3	3	2	1	3	1	1	Average
Davis et al. 2011 (39)	3	3	3	1	1	1	3	3	2	3	2	1	1	Low
Epstein et al. 1994 (20)	3	1	1	2	1	2	3	2	2	3	2	1	2	Low
Epstein et al. 1996 (35)	3	1	2	2	3	3	3	3	1	1	2	1	2	Low
Epstein et al. 1994 (41)	3	1	1	2	1	2	3	2	1	3	2	1	3	Low
Myers et al. 1998 (36)	3	1	1	2	3	3	3	3	1	1	3	1	1	Low
Decaluwe et al. 2006 (40)	3	2	3	2	3	3	3	3	2	3	3	1	3	Average
Goldschmidt et al. 2010 (37)	3	1	3	3	2	2	3	3	2	3	3	1	3	Average

Quality Criteria factors

- A) The study is based on a sound theoretical rationale from which the aims and hypotheses are clearly derived.
- B) The sample is representative of the overweight/obese child population.
- C) Recruitment procedures are clear to ensure that any recruitment bias could be considered.
- D) Inclusion/exclusion criteria are clearly defined ensuring that the sample is representative.
- E) Attrition rates are clear allowing the representativeness of the sample to be considered.
- F) Clear criteria have been used to define overweight/obesity which is based on standardised guidelines.
- G) The measure of childhood psychological functioning is psychometrically robust.
- H) The measure of parental psychopathology is psychometrically robust.
- I) The child questionnaire takes a triangulated approach ensuring the highest quality of information is gathered.
- J) The study includes assessments of mental health/psychological functioning of both parents.
- K) Appropriate statistical tests are used to allow conclusions about the relationships to be drawn
- L) Statistical power of the study is addressed.
- M) Generalizability, limitations and implications are clearly discussed.

Table Key

3 = well-covered

2 = adequately addressed

1= poorly addressed

0 = not applicable

Overall

High = at least 75% rated as well covered

Average = 50-74% rated as well covered

Low = less than 50% rated as well covered

Quality of included studies

Ratings for each of the studies on the 13 quality criteria are displayed in Table 2. As the papers employed different methodologies the rating scale does not offer a means to compare exactly across all studies. However it does provide a way to consider the relative strengths and weaknesses of each study's methodology on a variety of key points and an overall comparison guide. Of the studies included (42) and (43) were found to have the highest methodological quality in relation to the current review scoring ratings of well covered for more than 75% of the quality criteria.

Rationale for Study

All ten of the studies reviewed addressed a clear theoretical rationale for their study providing background justification which was relevant to the readers understanding and relevant to the current review. All ten contextualised the development of their research and are based on the previous research available, highlighting the need for more information regarding the psychological functioning of children. As such, all ten were rated well covered in relation to rationale for the study.

Recruitment and sampling

The studies included in the review varied markedly on the representativeness of the samples included. Recruitment procedures are clearly defined for five of the ten papers which were rated as 3 – well covered, (21, 37, 39, 40, 42), whilst (35) and (43) were rated to have provided adequate information - 2. However, (20, 36, 41) were deemed to have provided poor details regarding the recruitment process receiving ratings of 1. Only one of the studies was rated as having a recruitment procedure which was deemed to be unbiased and would therefore be generalizable to the overweight/obese child population as it recruited through

the media (39), a clear methodological strength in being able to interpret any results. The remainder of the studies included all recruited from individuals presenting to weight management programmes. This introduces an inherent bias as individuals presenting for treatment are not found to be representative of the general obese population and often present with a higher rate of psychiatric issues (43). One study, (40) was rated slightly higher as it recruited from both in-patient and out-patient samples.

The review of the studies also varied regarding how much information they provided on the inclusion and exclusion criteria and the numbers declining or dropping out with only two studies covering both of these areas well (42, 43). This again has implications for the generalizability of the study. For example if the majority of obese children dropped out of the studies this has ramifications on how relevant the findings would be.

Measures

All ten of the studies reviewed included measures of childhood psychological functioning which were deemed robust in their psychometric properties therefore receiving ratings of well covered. Similarly eight of the studies included a parental questionnaire which was deemed robust (21, 35, 36, 37, 39, 40, 42, 43), rating 3 – well covered, with the remaining two (20, 41) using a scale that was assessed as adequate, receiving a rating of 2.

Two of the studies used a triangulated method of assessment (42, 43). These included a self-report measure of the child's psychological functioning, an independent clinician's report of the child and a self-report of parental psychopathology, which assessed both parents. This was thought to be the strongest method for assessing both the child and parental functioning. Indeed (43) also included a further measure where they asked parents to rate their child. Five

studies (20, 21, 37, 39, 40) involved the child and parent each completing self-report measures a slightly weaker methodology. The final three studies (35, 36, 41) relied solely on parental report of both the child and themselves. This may result in unreliable conclusions as parental reports have been found to be significantly different to child self-reports. Indeed as one of the studies has demonstrated (21), one third of the children reported themselves as having a psychiatric difficulty when two thirds of the mothers reported their child as having a potential mental health problem. This shows a substantial difference between the view of the child and their parents. This has often been found in the literature with parents often rating their children as having considerably more psychological difficulties than the child would rate themselves (e.g. 44, 45). Furthermore a variety of evidence has indicated that mental health difficulties can influence perception so it is possible that a parent with mental health difficulties may present a skewed perception of their child's well-being/ability to cope with difficulties.

The final aspect in relation to measures is the classifications that have been used for measuring overweight/obesity which have implications for the studies themselves and the generalizability of the sample. Six of the papers were rated as having used measures of BMI that were well defined and standardised, receiving a rating of 3 – well covered (21, 35, 36, 40, 42, 43). Three of the papers however were defined as using unclear measures, receiving a rating of 2 (20, 37, 41) with the final paper receiving a rating of poorly addressed as the study did not use a clear measure of BMI (39). This reduces the comparability between the studies.

Statistical analysis

A range of statistical analyses were employed across the ten studies included in the review. Six of the studies were assessed to be using appropriate statistical analyses, which were well reported allowing for ease of interpretation of the results (21, 36, 37, 40, 42, 43). The remaining four studies (20, 35, 36, 41) were found to have adopted appropriate methods of statistical analysis although the analyses were not always reported exactly. None of the papers reviewed report any power calculations questioning the reliability of any conclusions reached in the papers.

Generalizability

The generalizability of the studies varied considerably across the ten studies included. The main limitations of the studies were difficulties with sampling techniques with samples being reported as a poor representation of the overweight/obese child population and the papers not addressing this. This was due to the fact that the participants were only recruited from treatment seeking populations and therefore were only representative of this group of individuals

Summary of the Main Findings

Three of the studies indicated that despite high levels of overweight/obesity, many of the children included within the studies fell within normal ranges of psychological functioning with (41) reporting up to 71%, (21) 29 % of obese children and 37% of obese adolescents and (35) reporting around 51%. This suggests that it may not be obesity alone that is causing psychological difficulties in these children. It is important to consider this in light of the rating of the studies. Studies (35, 41) were rated as low and (21) was rated as average. For those children who were found to have psychological difficulties all ten of the studies found

significant relationships between parental psychopathology and childhood psychological functioning, although due to methodological quality and scientific rigour the results of the included studies must be interpreted with caution.

Maternal mental health issues and childhood functioning

Three of the studies included looked at maternal psychopathology and childhood psychological functioning only (21, 35, 36). The studies (21, 35) assessed the relationship at one time point. One study (35) found that maternal psychiatric symptoms were more strongly related to psychological problems in moderately obese children seeking treatment than the extent of their obesity. They concluded that in both of the samples within their study, child obesity did not account for any variance in child psychosocial problems over and above that which was accounted for by maternal psychopathology and family socio-economic status. This must also be considered in relation to the quality of the studies which were both rated as low. In (21), they reported that one third of children and adolescents self-reported psychiatric difficulties. The maternal ratings reported two thirds of the children as experiencing some psychological maladjustment. Furthermore they concluded that youth self-report and mother reported psychological difficulties were most strongly associated with maternal psychopathology. However, (21) was rated as average quality overall and the other two studies were rated as low (35, 36) with all three studies having difficulties rated for representativeness of their sample and their statistics. As a result the conclusions must be interpreted with caution.

The final study which assessed the mental health of mothers only was (36) an intervention study where families received the traffic light diet and an intensive behavioural support

intervention. The study concluded that improvements in maternal psychological symptoms were related to improved psychosocial adjustment in their children as rated by the CBCL. Together these studies indicate a significant relationship, in particular between maternal psychopathology and childhood psychological functioning both in cross-sectional and intervention studies.

A number of studies which rated the mental health of both parents found a particularly strong relationship between maternal mental health and child mental health. In (40) they found the most significant association between children's problem behaviour and maternal psychopathology. They also found this effect was partly mediated by the parenting style of inconsistent discipline, although this was more prominent in externalising behaviour than internalising. Similarly (42) found a significant association between maternal psychopathology, particularly anxiety and somatisation symptoms in the mother and psychopathological maladjustment and bulimic symptoms in obese adolescents. Study (42) was rated as high quality and (40) rated as average although results must be interpreted with caution as both were found to be unrepresentative of the general obese population.

Therefore in summary, five of the studies included found a significant relationship between maternal psychopathology and childhood psychological functioning even though two of these studies considered both parents (40, 42).

Studies assessing both parents

The remaining five studies all assessed the relationship between parental psychopathology of each parent and childhood psychological functioning and found effects for both parents. One of the studies, (43), assessed the relationship and also drew comparisons between obese children and children with insulin dependent diabetes. They concluded that there was an increase in psychological disturbance in children whose parents were found to have higher rates of psychopathology. These results were corroborated by the clinician ratings of the children where 88 children obtained at least one DSM-IV diagnosis – most notably an anxiety disorder. The study further reported no relationship between obesity in either the child or parents and the frequency of psychiatric disorder. Finally in comparison to diabetic children, obese children were found to have poorer social skills and higher scores on internalising behaviour problems (such as anxiety and depression) and externalising behaviour problems (such as aggressive behaviour). This study was rated as high quality with one of the highest methodological ratings for using a triangulated approach but again was found to have issues with an unrepresentative sample for the general obese population due to only recruiting from treatment seeking children.

The remaining four papers (20, 37, 39, 41) all assessed the relationship between both parents and the child. Both (20) and (41) found that the majority of the children within the study fell within the normal range for their CBCL scores. For the children with elevated scores on the CBCL both papers concluded a significant relationship between parental psychiatric symptoms and childhood psychological symptoms. The study (37) found that the parents of children assessed as high on the CBCL Social Problems subscale rated themselves as having greater levels of their own general psychopathology. Finally in the study on obesity among African America Children, (39) identified a significant role of parental depression in

childhood obesity and this in turn can affect childhood weight management treatment outcomes.

Therefore in summary the main conclusions drawn from the papers assessing both parents were that the majority of children fell within the normal range for psychological functioning. However, for those children deemed to have difficulties in their psychological functioning, there was a significant relationship between this and parental psychopathology.

Discussion

Summary

This review aimed to investigate the relationship between the mental health of overweight/obese children and the psychological functioning of their parents. The studies included assessed this relationship using a variety of methodologies finding mixed results. The results indicated that it is not overweight/obesity itself which accounts for psychological difficulties in isolation as not all children with weight problems have psychological problems within the clinical range. Indeed two of the studies concluded that obesity did not account for difficulties in psychological functioning of an obese child over and above other factors e.g. maternal psychopathology (35 & 41). These results must be interpreted with caution as both of these papers were rated as low quality overall. However for those who do experience psychological difficulties, there appears to be a significant relationship between this and parental psychological functioning. Three of the papers reviewed only mothers but two further studies (40, 42) assessed both parents and found the main effect for mothers. Whilst the systematic review provides evidence of the existing relationship between childhood psychological functioning and parental psychopathology there are a number of

methodological difficulties within the literature which prevent conclusions being drawn and further generalized to the overweight/obese population.

The majority of the studies are cross-sectional in design. This precludes the ability to be able to determine causality (37). Furthermore due to the design of the studies involved, conclusions cannot be drawn regarding any developmental implications of the relationship. Children go through different stages as they develop cognitively in childhood (46). As discussed earlier parental mental health can have different implications for a child at different stages of their development. However it is unclear specifically what this relationship is and how this impacts on children who are overweight/obese.

The studies included within the current review do not allow comparisons between the children involved in the study and the general child population to be drawn. Therefore although specific vulnerabilities for overweight/obese children have been suggested, the review provides no further information regarding these. However, (45) completed a large scale review and concluded that obese children are more likely to experience a variety of psychological and psychiatric difficulties than their non-obese counterparts, with girls especially at risk. When trying to relate the current findings to the normal weight population again comparisons are difficult. In general, whilst a relationship between childhood psychological functioning and parental mental health has been indicated in children of healthy weight (47), this has been criticised for being too focused on researchers' judgements and too heavily based on restrictive diagnostic categories which fail to take account of the child's perspective.

Whilst the results of the review do indicate a relationship between childhood psychological functioning and parental mental health in children who are overweight/obese and notwithstanding the inherent weaknesses of the studies included, the available evidence falls short in allowing any further conclusions. Such conclusions would enhance the theoretical models discussed regarding the exact nature of the relationship. Therefore whilst the review aids our knowledge that there is a relationship between childhood psychological functioning in overweight/obese children and the mental health of their parents, the research to date does not further our knowledge of the exact nature of this relationship. The theoretical model of attachment has already been discussed and the implications of a disrupted attachment leading to structural vulnerabilities in the child. However to the author's knowledge no research to date has included additional measures for example measures of attachment, to further clarify in more detail the nature of the relationship – such as disruption of attachment. Indeed it is unclear whether the psychological difficulties assessed in the parents result in the childhood psychological difficulties or are a result of having a child who is overweight/obese and suffering from psychological issues (Isnard et al 2010).

Future research directions

The current review has provided information regarding the presence of a relationship between overweight/obese children's psychological functioning and the mental health of their parents. Due to methodological limitations the conclusions must remain tentative. It would be beneficial for future research to be completed which contains a higher scientific rigour allowing more emphasis to be placed on conclusions drawn such as using a more representative sample and clearer recruitment procedures. However the available research falls short in providing information regarding the exact nature of the relationship and

underlying mechanisms. As none of the studies examined the nature of the relationship, further research is necessary to understand this. For example future research could include an assessment of attachment to determine whether this affects the psychological functioning in a child in the context of parental mental health. The cross sectional design of the studies included within the review also limit the ability to determine any causal relationship and developmental implications. Therefore completing research which is longitudinal in design would allow both causal relationships to be investigated and the role of childhood development in the process. Whilst the research included in the current review is all quantitative, the completion of qualitative reviews may be helpful to gain subjective insight into the mechanisms underlying the relationship – particularly in relation to parenting styles and learned behaviours.

Clinical Implications

Despite the varying methodological quality of the papers included in this review, the findings suggest that childhood psychological functioning is highly related to parental psychopathology. This has clear implications in terms of the provision of treatment of weight management and psychological issues related to overweight/obesity. As research has suggested a bi-directional relationship between mental health issues and obesity where one condition is known to perpetuate the other (e.g. 19,48), it is important that all aspects contributing to the conditions are considered. It seems imperative that when assessing and treating the psychological well-being of children who are overweight/obese their parents are also considered. Indeed perhaps more family interventions would seem appropriate. The evidence has suggested that when parental factors are included and treated, this can have

implications for the mental well-being of the child, improving their psychological functioning and the success they achieve in weight loss (36).

Strengths of current review

The authors attempted to limit bias by contacting authors prominent in the field to obtain unpublished results for inclusion within the review. Attempts were also made to control for any rating bias as each paper was rated independently on methodological quality by two of the authors, increasing the degree of inter-rater reliability. The review also appears to be the first of its kind looking at the relationship between parental mental health and childhood psychological functioning thus furthering our understanding of possible mediating/moderating variables which could have potential implications for treatment and widen our scope for further intervention.

Limitations of current review

The papers identified in the review were conducted in a variety of different countries. Whilst obesity rates remain a growing problem in the majority of countries across the world (1), prevalence rates and potential implications may vary across nations. Indeed in their study (39) who acknowledge that anecdotal information suggests that childhood obesity is more accepted within the African American community. Obesity problems appear to be growing at different rates in different countries. Therefore in drawing any conclusions it is important to consider whether the results would hold or whether they remain culturally specific as with (39). In fact in some cultures it is clear that obesity is a sign of wealth and prosperity (e.g.

49, 50). Assessing the cultural specificity of the results may also have been affected by limiting the review to only papers published in English.

A further possible limitation of the study is the timescale from which the papers were selected. The study includes papers which span the previous twenty years. As discussed, obesity rates have increased substantially over the past few years. Indeed, while estimations have been made that obesity rates have increased significantly, the exact figure remains unclear. Therefore it is difficult to establish whether results carried out in a study completed twenty years ago are representative of the modern scale of the obesity problem. Whilst there is no way to address this, the time specificity of the studies is something which must be considered when interpreting the results.

The current review is also limited by the measures used to assess overweight/obesity within the study. All ten of the studies within the current review used BMI data. However, there is some variation on the computation of the BMI scores with four studies using % overweight as the main measure, four studies using BMI-Z scores, one study using centiles and one study where it is unclear what is used. This reduces the ability for comparisons between studies. This reflects difficulties with the general evidence base where there is no clear consensus on the cut-offs for overweight/obesity. There has been a variety of criticisms suggesting the cut-offs for weight categories are somewhat arbitrary (51). To date, however, BMI data, despite its difficulties remains the recommended measurement technique (52).

Conclusion

The studies included within this review appear to show a significant relationship between reduced childhood psychological functioning amongst overweight and obese children in the presence of parental mental health difficulties. The relationship appears to be most prominent with mothers. However, conclusions based on the current review are limited by the quality of the included papers and inherent difficulties in measuring overweight/obesity. This limits the ability to draw comparisons with the general childhood overweight/obese population and with normal weight children. Further research is required which encompasses a higher scientific rigour, using clear recruitment methods, a triangulated approach and a population which is more generalizable to the overweight/obese population before any firm conclusions can be reached. Whilst the review shows the presence of a relationship, this is where any conclusions end – future research is necessary to understand the mechanisms underlying this relationship for example the inclusion of a measurement of attachment. Longitudinal research would also be beneficial as it takes into account causal and developmental elements.

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References

1. Swinburn BA, Sacks G, Hall KD et al. The global obesity pandemic: shaped by global drivers and local environments. *The Lancet*. 2011; 378:804-814.
2. Gray L, Leyland AH. Obesity. In: Rutherford L, Sharp C, Bromley C, editors. *The Scottish Health Survey 2011 volume 2: children*. Edinburgh: The Scottish Government Health Directorate; 2012. p.101-115.
3. Scottish Intercollegiate Guidelines Network. SIGN 115: Management of Obesity. A national clinical guideline. Edinburgh: Scottish Intercollegiate Guidelines Network; 2010.
4. Vivier P, Tompkins C. Health consequences of obesity in Children and Adolescents. In: Jelalian E, Steele RG, editors. *Handbook of childhood and adolescent obesity*. New York: Springer; 2008. p.11-24.
5. Wardle J, Cooke L. The impact of obesity on psychological well-being. *Best Pract Res Clin Endocrinol Metab*. 2005; 19:421-440.
6. Griffiths LJ, Parsons TJ, Hill AJ. Self-esteem and quality of life in obese children and adolescents: A systematic review. *Int J Pediatr Obes*. 2010; 5:282-304.
7. Aldridge J, Becker S. *Children caring for parents with mental illness: Perspectives of young carers, parents and professionals*. MIT Press; 2003.
8. Parkes A, Sweeting H, Wight D. *Growing Up in Scotland: Overweight, obesity and activity*. Edinburgh: Scottish Government; 2012.

9. Dunne L, Sneddon H, Iwaniec D, Stewart, MC. Maternal mental health and faltering growth in infants. *Child Abuse Rev.* 2007; 16,5: 283-295.
10. Coolbear J, Benoit D. Failure to thrive: Risk for clinical disturbance of attachment? *Infant Ment Health J.* 1999; 20,1: 87-104.
11. O'Brien LM, Heycock EG, Hanna M, Jones PW Cox J L. Postnatal depression and faltering growth: a community study. *Pediatrics.* 2004. 113,5: 1242-1247.
12. Duniz M, Scheer PJ, Trojovsky A, Kaschnitz W, Kvas E, Macari S. Changes in psychopathology of parents of NOFT (non-organic failure to thrive) infants during treatment. . *Eur Child Adolesc Psychiatry.* 1996; 5,2: 93-100.
13. Smith M. Parental mental health: disruptions to parenting and outcomes for children. *Child Fam Soc Work.* 2004; 9,1: 3-11.
14. Oyserman D, Bybee D, Mowbray C. Influences of maternal mental illness on psychological outcomes for adolescent children. *J Adolesc.* 2002; 25,6: 587-602.
15. Bowlby, J. Attachment and loss, volume i: Attachment. 1969.
16. Howes C. Attachment relationships to multiple caregivers. In: Cassidy J, Shaver PR. editors. *Handbook of attachment: Theory, research, and clinical applications.* Rough Guides. 1999 p671-687.
17. Zeanah CH, Berlin LJ, Boris NW. Practitioner Review: Clinical applications of attachment theory and research for infants and young children. *J Child Psychol Psychiatry.* 2011; 52,8: 819-833.

18. Reupert A, Maybery D. Families affected by parental mental illness: A multiperspective account of issues and interventions. *Am J Orthopsychiatry*. 2007; 77,3: 362-369.
19. Markowitz S, Friedman MA, Arent SM. Understanding the relation between obesity and depression: causal mechanisms and implications for treatment. *Clin Psychol: Science and Practice*. 2008; 15,1: 1-20.
20. Epstein LH, Wisniewski L, Weng R. Child and parent psychological problems influence child weight control. *Obes Res*. 1994; 2:509-515.
21. Zeller MH, Saelens BE, Roehrig H, Kirk S, Daniels SR. Psychological adjustment of obese youth presenting for weight management treatment. *Obes Res*. 2004; 12:1576-1586.
22. Thompson RA, Meyer S. The socialization of emotion regulation in the family. In Gross J. editor. *Handbook of emotion regulation*. New York, NY. Guildford Press. 2007; p249-268.
23. Nachmias M, Gunnar M, Mangelsdorf S, Parritz RH, Buss K. Behavioral inhibition and stress reactivity: The moderating role of attachment security. *Child Dev*. 1996; 67,2: 508-522.
24. Gerhard, S. *Why love matters. How affection shapes a baby's brain*. Hove, East Sussex, NY: Brunner-Routledge. 2004.
25. Tarullo, A. R., & Gunnar, M. R. Child maltreatment and the developing HPA axis. *Horm Behav*. 2006; 50,4: 632-639.

26. Halligan SL, Herbert J, Goodyer IM, Murray L . Exposure to postnatal depression predicts elevated cortisol in adolescent offspring. *Biol Psychiatry*. 2004; 55,4: 376-381.
27. Goodyer IM, Tamplin A, Herbert J, Altham PM. Recent life events,cortisol, dehydroepiandrosterone and the onset of major depression in high-risk adolescents. *Br J Psychiatry* 2000 177:499 –504.
28. Björntorp, P., & Rosmond, R. Obesity and cortisol. *Nutrition*. 2000; 16,10: 924-936.
29. Goodman, E. Socioeconomic Factors Related to Obesity in Children and Adolescents. In Jelalian E, Steele RG. Editors. *Handbook of Childhood and Adolescent Obesity, Issues in Clinical Child Psychology*. Springer Science, New York. 2008. P127-143.
30. Anderson SE, Gooze RA, Lemeshow S, Whitaker RC. Quality of early maternal–child relationship and risk of adolescent obesity. *Pediatrics*. 2010; 129,1:132-140.
31. Bose M, Oliván B, Laferrère B. Stress and obesity: the role of the hypothalamic–pituitary–adrenal axis in metabolic disease. *Curr Opin Endocrinol Diabetes Obes*. 2009; 16,5: 340.
32. Kyrou, I, Chrousos GP, Tsigos, C. Stress, visceral obesity, and metabolic complications. *Ann. N. Y. Acad. Sci*. 2006; 1083,1: 77-110.
33. Jansen E, Mulkens S, Jansen . Tackling childhood overweight: treating parents exclusively is effective. *Int J Obes*. 2011; 35,4; 501-509.
34. Dodge KA. Developmental psychopathology in children of depressed mothers. *Dev Psychol*. 1990; 26: 3-6.
35. Epstein LH, Myers MD, Anderson K. The association of maternal psychopathology and family socioeconomic status with psychological problems in obese children. *Obes Res*. 1996; 4:65-74.

36. Myers MD, Raynor HA, Epstein LH. Predictors of child psychological changes during family-based treatment for obesity. *Arch Pediatr Adolesc Med.* 1998; 152:855.
37. Goldschmidt AB, Sinton MM, Aspen VP et al. Psychosocial and familial impairment among overweight youth with social problems. *Int J Pediatr Obes.* 2010; 5:428-435.
38. Scottish Intercollegiate Guidelines Network. SIGN 50: A guideline developers handbook. Edinburgh: Scottish Intercollegiate Guidelines Network; 2011.
39. Davis M, Young L, Davis SP, Moll G. Parental depression, family functioning and obesity among African American children. *J Cult Divers.* 2008; 16:61.
40. Decaluwé V, Braet C, Moens E, Van Vlierberghe L. The association of parental characteristics and psychological problems in obese youngsters. *Int J Obes.* 2006; 30:1766-1774.
41. Epstein LH, Klein KR, Wisniewski L. Child and parent factors that influence psychological problems in obese children. *Int J Eat Disord.* 1994; 15:151-158.
42. Isnard P, Quantin L, Cortese S et al. Bulimic behaviours and psychopathology in obese adolescents and in their parents. *Int J Pediatr Obes.* 2010; 5:474-482.
43. Vila G, Zipper E, Dabbas M. et al. Mental disorders in obese children and adolescents. *Psychosom Med.* 2004; 66:387-394.
44. Schwimmer JB, Burwinkle TM, Varni JW. Health-related quality of life of severely obese children and adolescents. *J Am Med Assoc.* 2003; 289:1813-1819.

45. Reilly JJ, Methven E, McDowell ZC et al. Health consequences of obesity. *Arch Dis Child*. 2003; 88:748-752.
46. Carr A, McNulty C. Normal psychological development in adulthood. In: Carr, A. *The handbook of child and adolescent clinical psychology: A contextual approach*. Routledge. 2007 p 3-41.
47. Mordoch E, Hall WA. Children living with a parent who has a mental illness: a critical analysis of the literature and research implications. *Arch Psychiatr Nurs*. 2002; 16:208-216.
48. Luppino FS, de Wit LM, Bouvy PF. et al. Overweight, obesity, and depression: a systematic review and meta-analysis of longitudinal studies. *Arch Gen Psychiatry*. 2010; 67,3: 220-229.
49. Renzaho A. Fat, rich and beautiful: changing socio-cultural paradigms associated with obesity risk, nutritional status and refugee children from sub-Saharan Africa. *Health Place*. 2004; 10:105-113.
50. Mokhtar N, Elati J, Chabir R et al. Diet culture and obesity in northern Africa. *J Nutr*. 2001; 131:887S-892S.
51. Cole TJ, Bellizzi MC, Flegal KM, Dietz WH. Establishing a standard definition for child overweight and obesity worldwide: international survey. *BMJ*. 2000; 320:1240.
52. Reilly JJ. Assessment of obesity in children and adolescents: synthesis of recent systematic reviews and clinical guidelines. *J Hum Nutr Diet*. 2010; 23:205-211.

Chapter Two: Thesis Hypotheses

Following on from the systematic review which investigated possible links between childhood psychological functioning and parental mental health the empirical study aims to concentrate more specifically on childhood psychological functioning. The aim is to extend previous research which has considered individual psychological constructs in overweight/obese children and has compared these to healthy weight controls. The current study intends to examine these constructs together and assess them on a continuum. It will also include for the first time resilience as a possible protective factor. The following hypotheses are considered in this study;

Hypothesis one: Body Mass Index will significantly correlate with quality of life and self-esteem.

Hypothesis two: Resilience (as measured by resourcefulness and vulnerability) will be significantly correlated with quality of life.

Hypothesis three: Resilience (as measured by resourcefulness and vulnerability) will be significantly correlated with self-esteem.

Hypothesis four: Resilience (as measured by resourcefulness and vulnerability) will moderate the relationship between BMI and quality of life.

Hypothesis five: Resilience (as measured by resourcefulness and vulnerability) will moderate the relationship between BMI and self-esteem.

Chapter Three: Journal Article

Relationships between Body Mass Index, Self-Esteem, Resilience and Quality of Life in Children.

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**Written in accordance with Clinical Child Psychology and Psychiatry Journal guidelines
(see appendix 3)**

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Abstract

Objective: The study aimed to examine the possible relationships between children of differing Body Mass Index (BMI) and their self-esteem, resilience and quality of life. In contrast to previous research, BMI was considered on a continuum rather than comparing groups of differing BMI in the hope to understand further the relationship between BMI and quality of life and BMI and self-esteem. Furthermore, moderating effects of resilience on the relationship between BMI and quality of life and BMI and self-esteem were also assessed.

Methods: Eighty-two children aged 8-12 years old were recruited from a school intervention and clinic intervention, both dietetic run interventions looking at healthy life styles. Children were asked to complete self-report questionnaires on resilience, paediatric quality of life, self-esteem and some demographic information. Body Mass Index (BMI) data was also gathered for the children

Results: In contrast to previous research no relationship was found between BMI and quality of life or BMI and self-esteem. Whilst resilience was found to significantly correlate with both quality of life and self-esteem, no moderation effects of resilience on the relationship between BMI and either quality of life or self-esteem were found.

Conclusion: The significant relationships observed between resilience and both quality of life and self-esteem suggests that resilience training may be incorporated into interventions aimed at improving both quality of life and self-esteem. The study provides a basis for further research to clarify the relationship between resilience and obesity. The absence of a relationship between BMI and either self-esteem or quality of life may be in part due to sampling biases, as participants were predominantly of normal weight. Additional research is required to understand further the relationship between BMI and both self-esteem and quality of life to understand fully whether a child's BMI is required to reach a certain level before having a detrimental effect.

Keywords: Body Mass Index, BMI, Obesity, Quality of life Resilience, Self-Esteem, Weight

Introduction

Weight increase, particularly in children, is a growing concern across the World (Steele, Nelson & Jelalian, 2008). The definition of obesity varies between countries. However in the UK, 1990 reference data chart for age and sex for BMI in childhood defines overweight as $\geq 91^{\text{st}}$ centile and obese as $\geq 98^{\text{th}}$ centile (SIGN, 115). As yet we do not have a clear understanding of the exact numbers of children experiencing obesity worldwide. This may be due to inaccurate reporting from different countries and variations in the classification of obesity (Swinburn et al., 2011). Childhood obesity is known to have a variety of associated health conditions such as type II diabetes and cardiovascular disease (Reilly et al., 2003). As obesity was previously viewed as a medical condition, it is only recently that the psychological aspects which contribute to or result from the condition are becoming subject to research (Russell-Mayhew, McVey, Bardick & Ireland, 2012).

A large proportion of research is now focusing on childhood weight and obesity. This has highlighted associated stigma (Puhl & Brownell, 2003). Childhood obesity has been considered one of the most socially unacceptable and stigmatising experiences for a child (Schwimmer, Burwinkle & Varni, 2003), with children subject to both explicit bias, for example name calling and implicit bias where the child is judged according to an individual's unconscious beliefs regarding obesity (Li & Rukavania, 2009). Given the negative experiences resulting from obesity, research is now focusing on the psychological functioning of children in relation to their weight status.

Two of the first systematic reviews which began to look at the psychological consequences of obesity were conducted by Reilly et al., (2003) and Wardle & Cooke (2005). Reilly et al., (2003) was one of the first to include psychological factors in a critical appraisal of the health impact of paediatric obesity. Included within their review were nine studies which focused on psychological effects of obesity, five of which they rated as high quality. They concluded that obese children were more likely to experience psychological or psychiatric problems than non-obese children. Furthermore, they concluded the risk increased in girls and increased with age. Self-esteem was found to be most affected as well as an increase in behavioural difficulties. However the study provides little evidence regarding the appraisal criteria for the papers reviewed, therefore reducing the strength of any overall conclusions reached. A further review considering the psychological aspects of obesity was completed by Wardle and Cooke (2005). They looked at both clinical and community samples, considering research into body dissatisfaction, depression, self-esteem and obesity. However, unlike the previous review, they concluded that few children who are obese have lowered self-esteem or suffer from depression. They also found only moderate levels of body dissatisfaction in these children (Wardle & Cook, 2005). Their review did not specify inclusion or exclusion criteria for the studies involved or consider the methodological rigour of the studies they were reviewing. It is therefore difficult to establish why the studies within their review were selected again reducing the impact of any conclusions drawn. Following these initial reviews into the relationship between weight and psychological functioning the research base has grown significantly with an emphasis on self-esteem.

A variety of research has considered the impact of obesity on self-esteem. Hesketh, Wake and Waters, (2004) aimed to assess whether self-esteem precedes or develops as a result of obesity. They suggested that previous research into the area had been weakened as it was

based on clinical rather than epidemiological studies. They also suggested that research was heavily biased towards children with more severe obesity who present to services, potentially leading to an artificial inflation of observed psychological difficulties. Hesketh et al., (2004) study was based on a population sample who were assessed at two time points. They concluded that children who were overweight or obese had lower self-esteem scores than normal weight children, suggesting a strong association between reduced self-esteem and increased BMI. Their results however were based entirely on parental reports, known to be significantly different to child reports (e.g. Zeller, Saelens, Roehrig, & Daniels, 2004), therefore reducing confidence in any conclusions drawn.

A review by Cornette, (2007) also concluded that an increase in BMI is correlated with a reduction in self-esteem but not necessarily that lower BMI results in higher self-esteem. Again the review reported little detail regarding what quality criteria the papers were rated on. Franklin, Denyer, Steinbeck, Caterson and Hill, (2006) conducted a large scale study in Australia. They considered 2813 children and concluded that obese children had significantly lower perceived athletic competence, physical appearance and global self-worth than their normal weight counterparts (Franklin et al., 2006). However, the authors concluded that their study was limited by the low response rate from some weight groups. Furthermore despite drawing from a sample with varying ethnicities, this was not considered in the analyses. Nor were the possible implications of differing socio-demographics which have been found to impact on obesity (Parkes, Sweeting, & Wight, 2012).

The evidence for the impact of obesity on self-esteem appears mixed with suggestions that considering more specific aspects of self-esteem rather than global self-esteem may be more

beneficial (e.g. Schwimmer et al., 2003). Whilst research into self-esteem provides useful information regarding psychological adjustment, it has been suggested that a more overarching and multidimensional construct would be helpful to understand further the psychological impact of obesity (Schwimmer et al., 2003). Quality of life is one such construct.

Quality of life is defined by the World Health Organisation as including physical, mental and social well-being. Schwimmer et al., (2003), was one of the first studies to consider quality of life in relation to obesity. These authors compared quality of life in obese children and adolescents with quality of life in healthy weight children. Schwimmer et al., (2003) also compared obese children with children who had been diagnosed with cancer. They concluded obese children had significantly lower quality of life in all domains than healthy weight children and the results of the obese children's quality of life scores were comparable to children with cancer. However, their findings have been questioned as the sample was viewed as relatively small and heterogeneous having only been recruited from one treatment site. This therefore limits the generalizability of the results to the wider obese child population (Hughes, Farewell, Harris & Reilly, 2007). Further research into weight and quality of life has grown considerably but results have failed to replicate such significant findings.

In their review Tsiros et al., (2009) identified 28 studies which considered health related quality of life in obese children and adolescents. They pooled the data from 13 of these studies which utilized the same measure (Paediatric Quality of Life Inventory) and concluded an inverse relationship between BMI and quality of life, suggesting that as BMI

increases, quality of life decreases. Williams et al., (2011) suggested that the results of this study may have overestimated the relationship as Tsiros et al., (2009) combined community and tertiary samples. Williams et al., (2011) argued by doing so Tsiros et al., (2009) were considering only a treatment seeking sample who may be requiring support as a result of their reduced quality of life therefore not representative of the general obese population.

More recent studies into the relationship between quality of life and weight have continued to show similar findings. Williams et al., (2010) conducted a longitudinal study in the UK concluding the most important predictor of overweight/obesity in adolescence is previous BMI, although quality of life may have some impact. Two further studies were completed by Riaz, Shakoor, Dundas, Eiser, and McKenzie, (2010) and Wu, Ohinmaa and Veugelers, (2011), both comparing overweight and obese children to healthy controls and reporting lower quality of life in obese children. Riazi et al., (2010) further reported that quality of life in their sample, which was of mixed ethnicity, did not differ depending on degree of obesity. Wallander et al., (2013) again suggested that overweight, obese and extremely obese 5th graders on average experience worse quality of life than normal weight children. Ul-haq, Mackay, Fenwick and Pell, (2013) completed the first meta-analysis looking at the relationships between quality of life and BMI in children and adolescents. They determined obese children and adolescents had reduced quality of life, although the extent of this tended to be overestimated by their parents.

Research considering self-esteem and quality of life continues to grow (e.g. Griffiths, Parsons & Hill, 2010) and in doing so our understanding of the effects of obesity on these aspects is increasing. However, more recently it has been suggested that considering factors

such as self-esteem and quality of life in isolation may limit our knowledge (Russell-Mayhew et al., 2012). These authors suggested that an overall understanding which includes all of these psychological constructs and how they are linked in children with obesity may be more beneficial. This would allow a clearer understanding of how these factors are linked and their relationship with increased weight (Russell-Mayhew et al., 2012). In their recent review Russell-Mayhew et al., (2012) also suggested that, unlike in previous research, the focus into obesity should begin to be based more on protective factors which allow children to thrive despite their weight – factors such as resilience.

Resilience is defined as the skills, abilities and attributes which allow individuals to adjust to difficulties, hardships and challenges they may encounter (Avord & Drados, 2005). In their recent review Russell-Mayhew et al., (2012) suggested a theoretical model in which they proposed resilience as one of the wellbeing factors which should be promoted in working with obesity, taking the focus away from more negative aspects such as weight. However, to date, despite several studies suggesting the need for the inclusion of the construct of resilience (e.g. Pinhas-Hamiel et al., 2005), to the author's knowledge no study has been completed with children examining this. In adult obesity research a recent study looked at a range of factors including resilience in obese older adults in Great Britain and Portugal (Stewart-Knox et al., 2012). Stewart-Knox et al., (2012) concluded that lower resilience predicted higher BMI in Portugal and in Great Britain lower resilience was linked to higher waist circumference. The authors suggested that aspects of resilience can be learned and taught and this therefore has clinical implications for the prevention of obesity. They suggested that this could take place both at an individual level and at a public health level as attempts to increase resilience may indeed reduce obesity rates (Stewart-Knox et al., 2012).

In summary, previous research into the effects of BMI on self-esteem and quality of life have found mixed results. Research has primarily focused on differences between healthy weight, overweight and obese children to determine how this relates to both their self-esteem and quality of life. However, research has considered these constructs in isolation with limited investigation into how these factors relate to each other in children with differing BMIs. Finally, to date, no research has been completed with children which considers whether there is a relationship between resilience and weight and whether resilience may protect against the detrimental psychological effects of weight.

The current study aims to extend previous research to clarify further the relationships between BMI and self-esteem and between BMI and quality of life. The study will take place in the UK where previous research is scarce. Rather than comparing obesity to healthy weight control groups, the current study will investigate the relationship between BMI and both self-esteem and quality of life by considering the weight groups on a continuum. The first hypothesis is that BMI will positively correlate with both self-esteem and quality of life. The current study also aims to incorporate for the first time the construct of resilience and therefore hypotheses two and three predict significant correlations between resilience and quality of life and between resilience and self-esteem.

Finally, the study will consider the role of resilience in the relationship between BMI and quality of life and BMI and self-esteem. Evidence has been found to indicate a relationship between BMI and self-esteem and BMI and quality of life. It is hypothesised that resilience will act as a moderator in both of these relationships. A moderating variable is one which changes the strength or relationship between two variables (Frazier, Tix & Barron, 2004). In

the current study it is suggested that the relationship between BMI and self-esteem and BMI and quality of life will be affected in children with higher levels of resilience. That is higher levels of resilience will protect against the negative effects of increased BMI on self-esteem and of BMI on quality of life. Investigating these relationships for the first time will develop our theoretical understanding and may have clinical implications which could help increase the number of children whose self-esteem and quality of life is not impacted, despite their weight.

Method

Site selections

The study was completed in conjunction with the Paediatric Overweight Service Tayside (POST). This is a specialist dietetic service run by experienced dietitians. It offers a family based weight management intervention using an evidence based programme developed by Stewart et al., (2005), the Scottish Childhood Obesity Treatment Trial (SCOTT). The service is provided to children aged between two years and sixteen years who are above the 98th Centile for their weight (obese).

The POST service also provides separate school interventions working with children of all weight ranges in primaries five, six and seven (aged 8-12 years), in schools across Tayside, providing information around healthy eating, exercise and screen time (time spent watching television and or playing the computer). Both services are run by POST and both were used for recruitment in the current study. However for ease of clarity they will be referred to as *clinic intervention*, referring to the obesity weight management intervention, and *school intervention*, referring to the primary school intervention as described above.

Measures

Body Mass Index

Although BMI has received much criticism it remains the recommended method for measuring weight in children (Reilly, 2010). Body Mass Index was measured by trained POST clinicians both for the clinic intervention and the school intervention. Weight and height were measured using a calibrated balance beam and scales. This was converted using weight kg/height M², which was then classified using BMI centile charts, adjusted for age and sex. However as some of the children within the sample were known to have BMI of above 100th Centile, BMI standard Deviation (SD) was chosen as the measurement for analysis. This is recommended for weight classification by a number of sources (SIGN 115, Dinsdale, Riddler & Ellis, 2011). Children are considered overweight if their BMI is 1.33 SD greater than the mean and obese if their BMI is more than 2 SD greater than the mean.

Quality of Life

Quality of life was assessed using the Paediatric Quality of Life Inventory (PedsQL) (Varni, 1998). This is a self-report measure assessing health related quality of life in relation to specific conditions. The PedsQL consists of four domains, physical, emotional, social and school. The PedsQL is a widely used measure with good reliability and validity with an internal consistency reliability for the Total Scale Score of alpha of .83. This scale has been used for a variety of research including in children with diabetes (Varni et al., 2003), as a school health measure (Varni, Burwinkle, & Seid, 2006) and also in the obesity population (e.g. Pinhas-Hamiel et al., 2005 & Williams, Wake, Hesketh, Maher, & Waters. 2005), with no adverse effects identified.

Resiliency Scales for Children and Adolescents

Resiliency was measured using Resiliency Scales for Children and Adolescents (Prince-Embury, 2008). This self-report tool measures three different aspects of personal resilience, sense of mastery, sense of relatedness and emotional reactivity. The results are then combined to provide an overall score for resourcefulness and for vulnerability. Based on Eriksons's theory of psychosocial development, resourcefulness encompasses both the sense of mastery and sense of relatedness. Prince-Embury suggests that the development of these strengths depends on the child's behaviour through interaction with their environment giving an overall summary of a child's positive characteristics in relation to resilience. The Vulnerability Scale is defined as discrepancies between the child's emotional reactivity and his or her perceived personal resources. The Resiliency Scale has been found to be reliable and valid (Prince-Embury & Steer, 2010), with internal consistency found at .91 for the Resource Index and .86 for the Vulnerability Index (Prince-Embury, 2010). The scale has been used in a variety of research settings including with children who have Asperger's (Montgomery et al., 2008), in adolescent psychiatric inpatients (Kumar, Steer, & Gulab, 2010) and in juvenile offenders (Mowder, Cummings, & McKinney, 2010) with no adverse effects but as yet has not been used in research looking at childhood obesity.

Self-Esteem

Self-esteem was assessed using the Self Image Profile for Children (SIP-C) (Butler, 2001). A self-report measure asking children to rate "how they think they are" and "how they would like to be", with the discrepancy between the scores giving a global score for self-esteem. This has been found to be a reliable and valid measure (Butler & Gasson, 2005). It was developed in the UK but has been used in a variety of settings including evaluating school

counselling (Truneckova & Viney, 2008) and looking at school bullying (Kaloyirou & Lindsay, 2008) with no adverse effects. Although the SIP-C has as yet not been used with the obesity population, it has been found to be highly correlated with the Harter Self-Perception Profile which has been used routinely in this population (Butler, 2001). The self-esteem score represents a difference and the lower the difference the higher the self-esteem. However, in order to make this comparable to the other scales where higher scores are better, the self-esteem score has been represented as a negative value.

Recruitment

The study took place between May 2012 and July 2013. Following receipt of ethical permission from academic and health care authorities, participants were recruited through two methods. Participants completing the clinic intervention service who were aged between eight and twelve years and in primary five, six or seven, were given information about the study by a POST clinician during their clinic time and could opt-in by returning consent. Forty schools took part in the school intervention. All forty schools were approached and presentations given to explain the project, however only ten schools agreed to take part. Children taking part in the school intervention in the ten schools were given information by classroom teachers to take home to parents/guardians who were asked to opt-in by returning postal consent directly to the chief investigator using a stamped addressed envelope. All children taking part were given at least two weeks to consider the study and opt in.

Participants

There were 82 participants who completed the study aged between eight and twelve years in primaries five, six or seven who were taking part in either the clinic intervention or the school intervention. All measures used were normed for this age group and therefore developmentally appropriate. For inclusion in the study, participants were required to have no identified pre-existing health condition known to have a significant and on-going impact on quality of life (for example diabetes). This information was gathered from either class teachers or POST practitioners. Participants also needed to be able to read and write in English (help was provided to any children who had some difficulty with reading and writing skills). Children were excluded if they had a diagnosed learning disability (again identified by class teachers or POST practitioners) as the questionnaires being used have not been validated for use with individuals with learning disabilities.

Procedure

Participants were given questionnaires to complete either by a POST practitioner during their clinic intervention or the chief investigator during their school intervention. Questionnaires were counter-balanced to prevent order effects. Having already received consent from parent or guardians, participants were asked to provide their own written consent to ensure they were happy to take part in the study. They then completed some demographic information about themselves. Participants were then asked to complete self-report measures of self-esteem, quality of life and resilience. The school intervention took part during school time and the clinic intervention took part during a routine clinic appointment. Either the chief investigator or a POST practitioner was present at all times to answer any questions or deal with any distress, should it arise. Questionnaires were all answered anonymously and given

unique identifier codes so they could be matched to BMI data. Having previously sought consent during initial consent requests from parents or guardians, questionnaire data was then matched with BMI data which was collected by POST for all children taking part in POST's clinic interventions and school interventions.

Sample Size and Power Calculations

The statistical power of a test is the ability to identify an effect in a sample when it occurs. In order to determine the minimum sample size required to produce the estimated effect size and to reduce the chance of a type II error, power calculations were carried out a priori. As previous research looking at BMI and quality of life found a large effect size, it is reasonable to expect around a medium effect size (Schiwimmer et al., 2003) and this was used in determining power. In research looking at self-esteem and BMI, a medium effect size has been found (Griffiths et al., 2010) and was used in calculating power. As previous research has indicated a significant relationship between an increase in BMI and a reduction in quality of life, the current study aimed to assess whether resilience would moderate this relationship. As moderation is based on regression analysis, a power calculation using G*Power (Faul, Erdefelder, & Lang, 2007) suggested that for a medium effect size of 0.2 with statistical power of 0.8 at an alpha level of .05, a minimum of 81 participants would be required to detect an effect with five predictor variables (BMISD, resourcefulness, vulnerability and two interaction terms, *BMISD * resourcefulness* and *BMISD * vulnerability*).

Initially socio-demographic information was considered together with analysis for any significant differences for sex. Demographic information was also investigated. Correlations

were then conducted to determine any associations between BMI, Quality of Life, Self-esteem and Resilience. Finally moderation analyses were completed.

Results

Descriptive statistics

618 children were approached to take part in the study and 93 agreed. 11 data sets had to be removed as they were incomplete. From the school intervention, 526 were approached and 77 participants took part (15% response rate). Of the 526 approached who were taking part in the POST school intervention 126 were overweight/obese, 7 of these agreed to take part in the current study. From the clinic intervention who were all obese of the 94 approached 5 took part (5% response rate). Of the 11 data sets which were removed, 8 data sets were missing BMI data as the participants were absent when the BMI details were taken. The remaining 3 data sets were missing as the participants were absent from school when the questionnaires were completed⁴. As all of the missing results were found to be missing at random due to school absence the incomplete data sets were removed (Todman & Dugan, 2007). The remaining 82 data sets gives an overall response rate of children completing the study between 13-14%. Of the 82 there were 41 males and 41 females. As the results from the clinic response were so low, all data was analysed together. Implications for this will be discussed further later. The results for the response rates are displayed in Table 1.

⁴ As participants were unaware of the dates when the questionnaires were being completed their absence on the day was found to be due to chance.

Table 1. Details of children taking part in the study

	School Response	Clinic Response
Overall Response	77	5
BMI 2-90.9 th centile (-2 – 1.33SD)	70	N/A ⁵
BMI 91-97.9 th centile (1.33 – 2.00SD)	6	N/A
BMI above 98 th centile (<+2 SD)	1	5

Participants were aged between 8-12 years old with a mean age of 11.03 (SD=9.75), reported a range of 0-6 physical hobbies with a mean of 2.09 (SD=1.36). Participants watched between 0 and 8 hours of television per day with a mean of 1.87(SD=1.26) and spent between 0 and 4.5 hours on the computer (including ipads, iphones games consoles etc) with a mean of 1.18(SD=0.90).

Socio-economic status

Address details were not gathered for participants therefore preventing exact details for the analysis of socio-economic status, however school post-codes and thus their surrounding catchment areas for socio-economic status were used as a proxy measure. This index gives a score of deprivation levels according to the Scottish Index of Multiple Deprivation. Scores

⁵ Children would only be attending the clinic if their BMI was above 98th Centile therefore no children who fell into the clinic response were below this.

for the schools involved in the current study range from 1 – the most deprived to 5 – the least deprived, therefore taking into account all levels of deprivation.

Means, standard deviation scores and normality of the data were then analysed to determine the homogeneity of the sample.

Table 2. Means, standard deviations and range scores across the measures

	MEAN (SD)	Skew Z score	Kurtosis Z score
BMI SD	0.29 (1.19)	3.35	1.36
Paediatric Quality of Life	79.61 (14.99)	-3.14	-0.25
Resourcefulness	48.27 (16.73)	-2.17	-0.20
Vulnerability	45.44 (13.64)	1.94	-0.85
Self-esteem	-25.94 (19.53)	2.40	-0.07

As is evident from Table 2, some of the data was skewed and subject to Kurtosis. Data transformations were attempted in order to correct this (Field, 2013), however as these were unsuccessful, non-parametric correlations were selected. As previous studies have detected a difference between males and females (e.g. Reilly et al., 2003), exploration of the variables was carried out using a Mann-Whitney U test which revealed no significant differences between sex for quality of life ($U=814$, $p=.806$) or for self-esteem ($U=780.50$, $p=.578$). Therefore, for the rest of the analysis, sex was not used as a grouping variable.

Bivariate Spearman Correlations

Correlations between BMISD, Paediatric Quality of Life, Resourcefulness, Vulnerability and Self-esteem are presented in Table 3.

Table 3. Bivariate Spearman correlations among BMISD, Paediatric Quality of Life, Resourcefulness, Vulnerability and Self-Esteem

	Paediatric Quality of life	Resourcefulness (Resilience)	Vulnerability (Resilience)	Self-Esteem
BMISD	-.088	-.168	.160	-.142
N	82	79	78	82
Paediatric Quality of life	1	.639**	-.702**	.503**
N	82	79	78	82
Resourcefulness (Resilience)	-	1	-.896**	.516**
N		79	78	79
Vulnerability (Resilience)	-	-	1	-.540**
N			78	82

** correlation is significant at the $p=.001$ level

Hypothesis one: BMISD will significantly correlate with quality of life and self-esteem.

The results from the correlation analysis shown in Table 3 indicates that BMISD was not significantly correlated with either quality of life ($r_s=-.088$, $p=.434$) or self-esteem ($r_s=-.142$, $p=.202$).

Hypothesis two: Resilience (as measured by resourcefulness and vulnerability) will be significantly correlated with quality of life.

Correlation analyses indicated that resourcefulness was positively correlated with quality of life ($r_s=.639$, $p<.001$), suggesting an association between a child's quality of life and how resourceful they view themselves. Vulnerability was found to be negatively correlated with quality of life ($r_s= -.702$, $p <.001$), suggesting an association between quality of life and how vulnerable the child views themselves. This provides support for hypothesis two.

Hypothesis three: Resilience (as measured by resourcefulness and vulnerability) will be significantly correlated with self-esteem.

As Table 2 indicates, resourcefulness was positively correlated with self-esteem ($r_s= .516$, $p<.001$). This suggests an association in the current study between a child's resourcefulness and their self-esteem. Self-esteem is negatively correlated with vulnerability, which indicates an association between how vulnerable a child sees themselves and their self-esteem ($r_s=-.540$, $p<.001$) both of which provide support for hypothesis three.

Moderation analyses

Hypothesis four: Resilience (as measured by resourcefulness and vulnerability) will moderate the relationship between BMI and quality of life.

Although BMISD was not found to significantly correlate with any other variables as predicted by the moderation model, a non-significant relationship between BMISD and paediatric quality of life or between BMISD and self-esteem does not necessarily indicate

that the hypothesised moderation relationships between these variables is disconfirmed. Relationships may not have been found between the variables present in the model, however a significant moderation effect could still be present and therefore all of the planned moderation analyses were conducted (Frazier et al., 2004). As a moderating variable is known to change the strength or direction of a relationship and the relationship between BMI and self-esteem and BMI and quality of life has previously been found, it was important to test this. Resilience may still have been acting to moderate these relationships but may have reduced them to zero.

The main analysis focused on a moderation model using hierarchical multiple regression analyses, for which only the residuals are required to be normally distributed (Todman & Dugan 2007, Field, 2013). Therefore, histograms and scatterplots of residuals were examined for homoscedasticity and linearity and as these were all found to be normal a linear regression was used.

Table 4: Moderation analysis 1, interaction between BMISD and resilience (as measured by resourcefulness and vulnerability) as a moderator for quality of life

Step	Predictor Variable	β	SE β	t (sig)	R	R ²	Δ R ²	F (Sig)	R ² Change	F Change (Sig)
1	BMISD	-.187	1.052	-.178(p=.859)	.664	.441	.418	F(3,74)=19.462 p<.001*	.441	F(3,74)= 19.462 p<.001**
	Resourcefulness	.005	.153	.031(p=.976)						
	Vulnerability	-.672	.185	-3.630(p=.001)^						
2	BMISD	-.461	1.133	-.407(p=.685)	.678	.460	.422	F(5,72)=12.261 p<.001*	.019	F(2,74)=1.257 p=.291
	Resourcefulness	-.009	.171	-.056(p=.956)						
	Vulnerability	-.685	.198	-3.465(p=.001)^						
	BMISD * Resourcefulness	.153	4.685	.033(p=.974)						
	BMISD * Vulnerability	1.883	4.109	.458(p=.648)						

*Regression model significant at p=.001

**Significant increase in variance at p=.001

^Predictor variable significant at p=.001

Body Mass Index (SD) and resourcefulness and vulnerability were centred by converting them to Z scores with means of zero and an interaction term was created by multiplying the two Z scores together. This reduces the effects of multicollinearity (Todman & Dugan, 2007). The independent variables, BMISD, resourcefulness and vulnerability were entered into the model as step one. As can be seen from Table 4, the first step of regression model was significant and explained up to 44% of the variance. However it was only vulnerability which made a significant contribution. The moderators being tested were then entered into a hierarchical regression as a group and the interaction term (BMIS X RES) and (BMI X VUL) were then entered (Todman & Dugan, 2007). The value of R squared change, when the interaction variables were added to the predictor and moderator variables, was .019 and that change was non-significant, $F \text{ Change } (2,74) = 1.257, p=.291$. These non-significant interactions tell us that neither of the presumed moderators of resourcefulness or vulnerability moderated the effects of the predictor BMISD on the outcome variable paediatric quality of life. Therefore hypothesis four, that resilience (as measured by resourcefulness and vulnerability) moderates the relationship between BMISD and quality of life was not supported. This suggests that unlike initial predictions, in the current sample resilience does not change the size or direction of the relationship between BMISD and quality of life.

Table 5. Moderation analysis 2, interaction between BMISD and resilience (as measured by resourcefulness and vulnerability) as a moderator for self-esteem

Step	Predictor Variable	β	SE β	t (sig)	R	R ²	Δ R ²	F (Sig)	R ² Change	F Change (Sig)
1	BMISD	-.933	-.059	-.602(p=.549)	.549	.302	.273	F(3,74)=10.650	.302	F(3,74)=10.650
	Resourcefulness	.145	.130	.645(p=.521)				p<.001*		
	Vulnerability	-.566	-.420	-2.077(p=.041)^						
2	BMISD	-1.028	-.065	-.607(p=.545)	.552	.304	.256	6.303(5,72)	.003	.150(2,72)
	Resourcefulness	.129	.115	.506(p=.614)				p<.001*		
	Vulnerability	-.581	-.431	-1.965(p=.053)						
	BMISD * Resourcefulness	-.455	-.024	-.065(p=.948)						
	BMISD * Vulnerability	.515	.031	.084(p=.933)						

*Regression model significant at p=.001

**Significant increase in variance at p=.001

^Predictor variable significant at p=.050

Hypothesis five: Resilience (as measured by resourcefulness and vulnerability) will moderate the relationship between BMI and self-esteem.

After centering the independent variables, BMISD, resourcefulness and vulnerability were entered into the model as step one. The first level of the regression model was found to be significant and accounted for up to 30% of the variance although it was only vulnerability which made a significant contribution. The moderators being tested were then entered into a hierarchical regression as a group and the interaction term (BMIS X RES) and (BMI X VUL) were then entered (Todman & Dugan, 2007). The value of R squared change, when the interaction variables were added to the predictor and moderator variables, was .003 and that change was non-significant, $F \text{ Change}(2,72) = .150, p=.861$. These non-significant interactions tell us that neither of the presumed moderators of resourcefulness or vulnerability moderated the effects of the predictor BMISD on the outcome variable self-esteem. This therefore suggests that hypothesis five, resilience (as measured by resourcefulness and vulnerability) moderates the relationship between BMISD and self-esteem, was not supported. This indicated that in the current study resilience does not act to change either the direction or the strength of the relationship between BMISD and self-esteem.

Discussion

Previous research has compared quality of life and self-esteem in children who are obese with those of healthy weight status (Schwimmer et al., 2003, Franklin et al., 2006). This has been completed primarily by comparing healthy weight children with overweight and obese children. The results have been mixed but have generally found overweight/obese to children have significantly lower self-esteem and quality of life than healthy weight children. Despite recommendations (e.g. Pinhas-Hamiel et al., 2005, Russell-Mayhew et al., 2012), little work has been completed which considers factors which moderate the adverse effects of negative circumstances in obesity. Research has indicated that constructs such as resilience allow children facing adverse circumstances to achieve positive development (e.g. Kim-Cohen, Moffitt, Caspi & Taylor, 2004). Masten and Coatsworth (1998) defined this as “fundamental systems that generally foster competence in development operating to protect the child or counteract the threats to development”(Masten & Coatsworth, 1998. pp212). Resilience is known to develop as a result of a variety of personal, relational and environmental factors (Masten & Coatsworth, 1998) and has been shown to allow children to thrive despite being considered at risk (Luthar, Cicchetti & Becker, 2000). Although resilience has not been analysed in obesity, in other conditions, such as diabetes, it has been found to buffer against the negative physical and psychological implications of the condition (Yi, Vitaliano, Smith, Yi & Weinger, 2008). The present study was intended to increase our understanding of the nature of the relationship between quality of life, self-esteem and BMI and for the first time consider whether resilience is indeed allowing these children to thrive despite the adversities known to affect children who are overweight/obese.

The current study assessed any significant differences between males and females in the sample as previous research had suggested a difference (e.g. Reilly et al., 2003). As no significant differences for self-esteem or quality of life were found, the sample was analysed as a whole. The schools included a variety of areas of differing levels of deprivation therefore it was felt that the sample was homogenous enough to pool the results. All children were also receiving a broadly similar intervention, carried out by the same clinicians regarding healthy living. Therefore they were assessed to be similar in all respects other than their BMI and possibly their quality of life and or self-esteem. The study aimed to assess whether BMI would significantly correlate with self-esteem or quality of life. In contrast to previous research, this relationship was not found to be significant in the current sample. Previous studies however, have assessed this relationship by comparing overweight/obese children with healthy weight. Unlike previous research the current study was heavily skewed towards healthy weight children. The lack of relationship may be explained by the lack of variance in BMI. It may be that the relationship between BMI and quality of life is only relevant when BMI reaches the overweight/obese range. This provides support for the conclusions drawn by Tsiros et al., (2009) in their review that it is only when a child's weight is above the BMI mean that deficits in their quality of life are identified. Quality of life may be only affected within a certain range of BMI. Riazi et al., (2010) suggested in their study that degree of obesity is not related to degree of psychosocial functioning. In contrast Phillips et al., (2012) assessed obese children and extremely obese children and found positive correlations between degree of obesity and quality of life. The current study was limited in its recruitment as was working in conjunction with the POST team however future research would benefit from using a larger sample size for investigation. This would allow exploration of the effect BMI size may have on the constructs included in the study

and whether it is indeed only once BMI reaches a certain magnitude that the effects hold true.

The lack of support for the relationship between BMI and the other factors may be a result of developmental factors – particularly in relation to self-esteem. Previous research has indicated a relationship between BMI and self-esteem in primary school aged children such as the ones used in the current study (e.g. Franklin et al., 2006, Schwimmer et al., 2003). However there remains debate around whether self-esteem can be reliably measured in children who are below the age of adolescence (Harter, 2006). It is possible that self-concept and in turn self-esteem is influenced by a child's cognitive development and increasingly sophisticated social interactions and awareness. One developmental explanation of this is Piaget's theory of development (Carr, 2005). According to the Piagetian framework, in the context of secure attachment a child will progress from recognising themselves in the mirror around 2 years of age, through the pre-operational stage where their sense of self is based on physical aspects. It is hypothesised they will then progress on to the concrete operational stage where identity is based on personal traits and class membership. The framework suggests in adolescence a child progresses through the formal operational stage, where they have developed cognitively and are able to think more abstractly and describe themselves in terms of academic performance and social comparisons (Harter, 2006). Levels of self-esteem are believed to drop as a child progresses from childhood to adolescence (e.g. Robins, Trzesniewski, Tracy, Gosling & Potter, 2002). Although an adolescent does not necessarily feel worse the way they evaluate their self-esteem changes (Trzesniewski, Donnellan, & Robins, 2013). The current study included children aged 8-12 years. Within the context of the Piagetian framework, analysing the self-esteem results of the age groups together may have masked the differences in self-esteem due to progression through the different cognitive

phases, with the younger children still in the concrete operational stage whilst the older ones hypothesised to have progressed to the formal operational stage. This is a clear limitation of the study. However due to number restrictions it was out-with the realms of the current study to analyse the age groups separately and produce meaningful conclusions. Strauss (2000) considered the age groups separately and concluded self-esteem in pre-adolescence was not linked to obesity but in adolescence an effect was found between obesity and self-esteem. This was due to the necessity of the approval of peers. This approval of peers is particularly important in obesity as children who are overweight or obese are already likely to face stigma (Strauss, 2000).

The study also looked at correlations between self-esteem and resilience (as measured by resourcefulness and vulnerability) and found significant correlations in relation to both of these aspects of resilience. This therefore suggests that an increase in self-esteem is associated with an increase in resourcefulness and decrease in self-esteem with an increase in vulnerability. A significant relationship was also found between resilience (again as measured by resourcefulness and vulnerability) and quality of life. This again suggests that quality of life is associated with resourcefulness and with vulnerability. Hypotheses two and three were therefore supported. Although these relationships do not imply causality, it is important that further work is completed, again with a much larger sample size, to understand the nature of these relationships and indeed whether resilience may be integrated as a protective factor against possible reductions in self-esteem and quality of life.

A possible moderator effect of resilience which may have suppressed the relationships between BMI and quality of life and BMI and self-esteem was then assessed to determine

whether this was present. However, both moderation effects were found to be non-significant in the current sample. Hypotheses four and five were therefore not confirmed. Again it may be that this moderation effect could be linked to the magnitude of BMI. Therefore in the current study, as there was a limited number of children with BMIs into the overweight and obese categories, this effect was not found. As this is the first research of its kind looking at resilience, it is important that further work is completed on a larger scale. Again it may be that resilience is only relevant once BMI goes beyond a certain magnitude. However currently as research is in its infancy, no firm conclusions can be drawn regarding this.

Study limitations

Despite attempts to recruit participants, the response rate to the study was low at only 13% overall. This was particularly the case for children from the overweight and obese categories with only 7.5% of the study made up of children falling into each of these categories. For the school intervention roughly 15% of the overall sample who agreed to participate subsequently signed up for the study. This is significantly lower than other community sample studies which had much higher response rates. For example, Wallander et al., (2013) reported a response rate in the region of 77% for a community sample. The response rate from the clinic intervention was even lower with only 5% of those approached agreeing to take part in the study. This is also low in relation to other clinic intervention studies where Riazi et al., (2010) reported response rates of up to 85%.

The representativeness of the sample is one of the main limitations of the current study. The lack of relationships between BMI and self-esteem and between BMI and quality of life may

have been influenced by the somewhat skewed nature of the sample, which was significantly bias towards healthy weight children. Overall 85% of the sample who took part in the study fell within the normal weight category with only 7.5% overweight and 7.5% obese. This appears to be unrepresentative of the general population where in Scotland 22% of children aged six years were considered overweight or obese with 9% classified as obese (Parkes et al., 2012). The lack of significant results may be in relation to the small sample of overweight and obese participants who took part in the study which is significantly smaller than previous research where effects have been found. Previous studies also compared overweight and obese children with normal weight children rather than considering them on a continuum.

The study was completed in conjunction with the POST school intervention and clinic interventions. This method was chosen as it meant that BMI data was already available and did not require to be taken solely for the purposes of the study. However, as a result only children working with the POST service either through the clinic intervention or the school intervention could be approached to take part in the study in order to gain BMI data. This therefore limited the ability to widen the recruitment further when the response rate was noted to be low. Although a limitation, this does not account for the low response rate – particularly in relation to those children who were overweight or obese. Indeed 24% of the children who were given permission to take part in the school intervention with POST were overweight or obese and yet only 9% then agreed to take part in the current study. As stated earlier, the clinic response rate was even lower (5%). The study was based on a parental opt-in scheme, therefore it appears it may have been parental reluctance to allow children to participate in the study. Parents of the children taking part in the school intervention may have been unable or unwilling to recognise that their child is overweight and therefore would

not wish their child to take part in a study which may identify this and any resultant psychological implications. Research has indicated that only 14% of mothers are believed to recognise that their child is overweight (Parks et al., 2012). Therefore it may be that parental response was lower for overweight and obese children in the school intervention as they do not perceive any issue with their child.

Sampling bias of the study must also be considered as a limitation. Previous studies e.g. Riazi et al., (2010), have been criticised as children taking part were known to have very poor scores of quality of life and this was why they were seeking treatment. In the current sample the opposite may be true. This is due to the study sample being self-selecting. Participants who agreed to take part in the study appear to have quality of life scores above both obese children and healthy weight controls from previous studies. For example in their study Riazi et al., (2010) assessed obese children as having a mean quality of life score of 67.4 and healthy controls of 78.3. However, in the current study obese children were assessed to have a mean quality of life score of 66.12 and normal weight of 80.44. Overweight children's mean score was higher than normal weight and obese with a mean score of 83.33. This suggests that the current sample may have comparatively high quality of life scores and may not be representative of the general population either for normal weight or for overweight and obese children. Due to the self-selecting nature of the study, it may be that only those who were psychologically well agreed to take part in the study.

Several studies have suggested that by pooling data from a population sample similar to the school intervention in the current study and a clinical sample similar to the clinic intervention in the current study, weakens the results of the study (Wallander et al., 2013).

Ideally the current research would have analysed the data both as a complete group and also assessed for any differences between the two interventions. However due to the low response rate from the clinic intervention this was not possible and this must be considered when interpreting any results.

Finally the cross-sectional design of the study may be considered as a limitation, although this is a limitation of much of the research in this area. The cross-sectional design prevented the integration of developmental aspects into the current study. Future longitudinal research would provide more information regarding what stage developmentally these constructs may or may not be affected by obesity. This would allow a fuller understanding of what age self-esteem and possibly the other constructs begin to be affected by BMI. The protective role of resilience in relation to development could also be investigated further using a longitudinal design. Clearly obesity can have a significant impact on children and it is crucial that a fuller understanding of the developmental implications of this are gained in order to begin to intervene.

The main strength of the study is that it is one of the first to consider resilience in relation to BMI. In doing so, as Russell-Mayhew et al., (2012) suggested attempts are being made to move away from considering negative aspects of obesity and instead considering constructs which may protect against the negative psychological outcomes of obesity. Some children are able to withstand the negative effects of obesity and it is important we begin to understand what factors are protecting these children. As none of the constructs were found to be significantly related to BMI, it is vital to complete further work to understand the

reasons for this and whether they were due to the skewed nature of the sample or possibly a result of developmental factors.

A strength of the current study is that it has moved from previous group comparison studies to attempt to analyse normal weight to obesity on a continuum, which may be more representative of the general population. Although this has been somewhat unsuccessful, it may provide further information about the nature of the effects of obesity on quality of life and self-esteem, in that it is only once children reach a certain magnitude of BMI, that the effects on quality of life and self-esteem are noted. Due to the limited number of children above a certain BMI, this relationship was not noted in the current study. This is an important consideration in terms of future research and clinical interventions. The results are also primarily a population based study rather than being solely clinical which has been the critique of many other studies (e.g. Hesketh et al., 2003) and which helps with generalisation of results to child populations beyond a clinical obese sample.

A further strength of the study is that in comparison to previous studies which have considered different psychological constructs separately, the current study attempts to integrate these, using scales which are well validated for each construct, in order to further our understanding of any relationships. Although no significant effects were found, this may be due to the sample being primarily normal weight. Further research is therefore required with a more varied range of BMI than included in the current study – particularly in relation to BMIs of the overweight/obese range.

There is increasing evidence regarding the detrimental effects of obesity on a child's psychological well-being. Research into factors such as resilience which may protect against this effect is at most in its infancy. The findings of the current study, although tentative, have several implications for clinical practice. Significant relationships were identified between resilience and quality of life and resilience and self-esteem. Therefore as our understanding of these constructs and the links between them is beginning to grow, it is clear this must be used in clinical work. Incorporating resilience work into practice may help to increase self-esteem and quality of life, particularly during the transition to adolescence. This is likely to be beneficial both in the general child population and protecting against the negative effects of obesity.

Conclusion

In relation to the overall questions regarding our understanding of the relationship between BMI, self-esteem, resilience and quality of life, although the current research has attempted to begin to understand this relationship, this has not been possible due to difficulties with sampling biases. However the research is the first of its kind that integrates resilience as a protective factor assessing whether it may buffer against the negative psychological consequences of obesity. Due to the small sampling, the conclusions derived from the study are limited. Future research would benefit from being conducted on a larger scale to determine the relationship between these constructs and how they relate to BMI. Longitudinal research would also be beneficial in order to establish how the constructs are affected developmentally in overweight/obese children. This would allow any further clinical implications to be understood.

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References

Alvord, M. K., & Grados, J. J. (2005). Enhancing Resilience in Children: A Proactive Approach. *Professional psychology: research and practice*, 36(3), 238.

Butler, R.J. (2001). *The Self-Image Profiles for Children (SIP-C) and Adolescents (SIP-A) Manual*. London: The Psychological Corporation.

Butler, R. J., & Gasson, S. L. (2005). Self esteem/self concept scales for children and adolescents: A review. *Child and Adolescent mental health*, 10(4), 190-201.

Carr, A. (2005). *The handbook of child and adolescent clinical psychology: A contextual approach*. Routledge.

Cornette, R. (2008). The emotional impact of obesity on children. *Worldviews on Evidence-Based Nursing*, 5(3), 136-141.

Dinsdale, H., Ridler, C., & Ells, L. J. (2011). A simple guide to classifying body mass index in children. *National Obesity Observatory, Oxford*.

Faul, F., Erdefelder, E., & Lang, A-G. (2007). G*Power 3: a flexible statistical power analysis program for the social, behavioural and biomedical sciences. *Behavior Research Methods*, 39 (2): 175-191.

Field, A. (2013). *Discovering statistics using IBM SPSS statistics*. Sage.

Franklin, J., Denyer, G., Steinbeck, K. S., Caterson, I. D., & Hill, A. J. (2006). Obesity and risk of low self-esteem: a statewide survey of Australian children. *Pediatrics*, 118(6), 2481-2487.

Frazier, P. A., Tix, A. P., & Barron, K. E. (2004). Testing moderator and mediator effects in counseling psychology research. *Journal of counseling psychology*, 51(1), 115.

Griffiths, L. J., Parsons, T. J., & Hill, A. J. (2010). Self-esteem and quality of life in obese children and adolescents: A systematic review. *International Journal of Pediatric Obesity*, 5(4), 282-304.

Harter, S. (2006). The self. In W. Damon, R.M Lerner, N.D. Eisenberg (Eds). *Handbook of Child Psychology. Vol 3. Social Emotional & Personality Development*. 6th Edition. pp505-570. Hoboken. NJ: John Wiley & Sons.

Hesketh, K., Wake, M., & Waters, E. (2004). Body mass index and parent-reported self-esteem in elementary school children: evidence for a causal relationship. *International Journal of Obesity*, 28(10), 1233-1237.

Hughes, A. R., Farewell, K., Harris, D., & Reilly, J. J. (2006). Quality of life in a clinical sample of obese children. *International Journal of Obesity*, 31(1), 39-44.

Kaloyirou, C., & Lindsay, G. (2008). The self-perceptions of bullies in Cyprus primary schools. *European Journal of Special Needs Education*, 23(3), 223-235.

Kim-Cohen, J., Moffitt, T. E., Caspi, A., & Taylor, A. (2004). Genetic and environmental processes in young children's resilience and vulnerability to socioeconomic deprivation. *Child development*, 75(3), 651-668.

Kumar, G., Steer, R. A., & Gulab, N. A. (2010). Resiliency Profiles of child and adolescent psychiatric inpatients. *Journal of Psychoeducational Assessment*. 26(4), 315-326.

Lawford, J., & Eiser, C. (2001). Exploring links between the concepts of Quality of Life and resilience. *Developmental Neurorehabilitation*, 4(4), 209-216.

Li, W., & Rukavina, P. (2009). A review on coping mechanisms against obesity bias in physical activity/education settings. *Obesity Reviews*, 10(1), 87-95.

Luthar, S. S., Cicchetti, D., & Becker, B. (2000). The construct of resilience: A critical evaluation and guidelines for future work. *Child development*, 71(3), 543-562.

Masten, A. S., & Coatsworth, J. D. (1998). The development of competence in favorable and unfavorable environments: Lessons from research on successful children. *American psychologist*, 53(2), 205.

Montgomery, J.M., Schwean, V.L., Burt, J.G., Dyke, D.I., Thorne, K.J., Hindes, Y.L. (2008). Emotional intelligence and resiliency in young adults with Asperger's disorder: Challenges and opportunities. *Canadian Journal of School Psychology*, 23(1), 70-93.

Mowder, M.H., Cummings, J.H. & McKinney, R. (2010). Resiliency Scales for Children and Adolescents: Profiles of juvenile offenders. *Journal of Psychoeducational Assessment*, 28(4), 326-337.

Parkes, A., Sweeting, H., & Wight, D. (2012). Growing Up in Scotland: Overweight, obesity and activity. *Scottish Government*.

Phillips, B. A., Gaudette, S., McCracken, A., Razzaq, S., Sutton, K., Speed, L., ... & Ward, W. (2012). Psychosocial functioning in children and adolescents with extreme obesity. *Journal of clinical psychology in medical settings*, 19(3), 277-284.

Pinhas-Hamiel, O., Singer, S., Pilpel, N., Fradkin, A., Modan, D., & Reichman, B. (2005). Health-related quality of life among children and adolescents: associations with obesity. *International Journal of Obesity*, 30(2), 267-272.

Prince-Embury, S. (2008). The resiliency scales for children and adolescents, psychological symptoms, and clinical status in adolescents. *Canadian Journal of School Psychology*, 23(1), 41-56.

Prince-Embury, S., & Steer, R. A. (2010). Profiles of Personal Resiliency for Normative and Clinical Samples of Youth Assessed by the Resiliency Scales for Children and AdolescentsTM. *Journal of Psychoeducational Assessment*, 28(4), 303-314.

Puhl, R., & Brownell, K. D. (2003). Ways of coping with obesity stigma: review and conceptual analysis. *Eating behaviors*, 4(1), 53-78.

Reilly, J. J. (2010). Assessment of obesity in children and adolescents: synthesis of recent systematic reviews and clinical guidelines. *Journal of Human Nutrition and Dietetics*, 23(3), 205-211.

Reilly, J.J., Methven, E., McDowell, Z.C., Hacking, B., Alexander, D., Stewart, L., Kelmar, C.J.H (2003). Health consequences of obesity. *Archives of Disease in Childhood*, 88(9), 748-752.

Riazi, A., Shakoor, S., Dundas, I., Eiser, C., & McKenzie, S. A. (2010). Health-related quality of life in a clinical sample of obese children and adolescents. *Health and quality of life outcomes*, 8(1), 134.

Robins, R. W., Trzesniewski, K. H., Tracy, J. L., Gosling, S. D., & Potter, J. (2002). Global self-esteem across the life span. *Psychology and aging*, 17(3), 423.

Russell-Mayhew, S., McVey, G., Bardick, A., & Ireland, A. (2012). Mental health, wellness, and childhood overweight/obesity. *Journal of obesity*, 2012.

Schwimmer, J. B., Burwinkle, T. M., & Varni, J. W. (2003). Health-related quality of life of severely obese children and adolescents. *JAMA: the journal of the American Medical Association*, 289(14), 1813-1819.

Scottish Intercollegiate Guidelines Network, SIGN 115, (2010), *Management of Obesity, A national clinical guideline*.

Steele, R. G., Nelson, T. D., & Jelalian, E. (2009). Pediatric obesity: Trends and epidemiology. In *Handbook of childhood and adolescent obesity* (pp. 3-10). Springer US.

Stewart-Knox, B., Duffy, M. E., Bunting, B., Parr, H., de Almeida, M. D. V., & Gibney, M. (2012). Associations between obesity (BMI and waist circumference) and socio-demographic factors, physical activity, dietary habits, life events, resilience, mood, perceived stress and hopelessness in healthy older Europeans. *BMC public health*, 12(1), 424.

Swinburn, B. A., Sacks, G., Hall, K. D., McPherson, K., Finegood, D. T., Moodie, M. L., & Gortmaker, S. L. (2011). The global obesity pandemic: shaped by global drivers and local environments. *The Lancet*, 378(9793), 804-814.

Truneckova, D. & Viney, L.L. (2008). Small-group counselling with primary school children. *Personal Construct Theory & Practice*, 5, 139-148.

Trzesniewski, K.H, Donnellan B, & Robins, R.W. (2013). Development of self esteem. In V. Zeigler-Hill. *Self-Esteem. Current issues in Social Psychology*. pp 60-80. Psychology Press. Hove. East Sussex.

Tsiros, M. D., Olds, T., Buckley, J. D., Grimshaw, P., Brennan, L., Walkley, J., ... & Coates, A. M. (2009). Health-related quality of life in obese children and adolescents. *International Journal of Obesity*, 33(4), 387-400.

Todman, J. B., & Dugard, P. (2007). *Approaching multivariate analysis: An introduction for psychology*. Psychology Press.

Ul-Haq, Z., Mackay, D.F., Fenwick, E., & Pell, J.P. (2013). Meta-analysis of the association between body mass index and health-related quality of life among children and adolescents, assessed using the Pediatric Quality of Life Inventory Index. *The Journal of Pediatrics* 162(2), 280-286.

Varni (1998). The PedsQL™ *Measurement model for the Pediatric Quality of Life Inventory*.
<http://www.pedsql.org/pedsql12.html>

Varni, J. W., Burwinkle, T. M., & Seid, M. (2006). The PedsQL™ 4.0 as a school population health measure: Feasibility, reliability, and validity. *Quality of life research*, 15(2), 203-215.

Varni, J. W., Burwinkle, T. M., Jacobs, J. R., Gottschalk, M., Kaufman, F., & Jones, K. L. (2003). The PedsQL™ in Type 1 and Type 2 Diabetes Reliability and validity of the Pediatric Quality of Life Inventory™ Generic Core Scales and Type 1 Diabetes Module. *Diabetes care*, 26(3), 631-637.

Wallander, J.L., Kerbawy, S., Toomey, S., Lowry, R., Elliott, M.N., Escobar-Chaves, S.L.,... Schuster, M.A. (2013). Is obesity associated with reduced health-related quality of

life in Latino, black and white children in the community? *International Journal of Obesity*, 37(7), 920-925.

Wardle, J., & Cooke, L. (2005). The impact of obesity on psychological well-being. *Best Practice & Research Clinical Endocrinology & Metabolism*, 19(3), 421-440.

Williams, J. W., Canterford, L., Hesketh, K. D., Hardy, P., Waters, E. B., Patton, G. C., & Wake, M. (2011). Changes in body mass index and health related quality of life from childhood to adolescence. *International journal of pediatric obesity*, 6(2Part2), e442-e448.

Williams, J., Wake, M., Hesketh, K., Maher, E., & Waters, E. (2005). Health-related quality of life of overweight and obese children. *JAMA: the journal of the American Medical Association*, 293(1), 70-76.

Wu, X. Y., Ohinmaa, A., & Veugelers, P. J. (2011). Diet quality, physical activity, body weight and health-related quality of life among grade 5 students in Canada. *cognitive development*, 6, 8.

Yi, J. P., Vitaliano, P. P., Smith, R. E., Yi, J. C., & Weinger, K. (2008). The role of resilience on psychological adjustment and physical health in patients with diabetes. *British Journal of Health Psychology*, 13(2), 311-325.

Zeller, M. H., Saelens, B. E., Roehrig, H., Kirk, S., & Daniels, S. R. (2004). Psychological adjustment of obese youth presenting for weight management treatment. *Obesity Research*, 12(10), 1576-1586.

Chapter Four: Extended Methodology

This chapter aims to provide additional information regarding the methodology of the study included within this thesis. This includes further and more specific details regarding ethical considerations and ethical approval and further details regarding the setting up and completion of the recruitment process.

Design

The study incorporated a quantitative, cross-sectional design where participants, (aged 8-12 years old) recruited either through state schools or through the NHS, completed a pack of standardised self-report questionnaires on a one-off basis. The participants were also asked to complete some demographic information about themselves.

Ethical Issues and Approval

The present study was given approval by the East of Scotland Research Ethics Committee on Medical Research who made some recommendations regarding simplification of participant information sheets (PIS), which were then carried out. They also requested that parents/guardians be asked to consent to their child's general practitioner (GP) being informed about their participation in the study. This was therefore amended and parents/guardians were given space on the consent form to include the details of their child's GP should they wish them to be informed about the child's participation in the study. The Ethics Committee also had concerns about the use of Body Mass Index (BMI) as a measure.

The Chief Investigator discussed this at length and it was agreed that while this measure must be interpreted with some caution this is the most reliable measurement to date and is used by the World Health Organisation and also recommended in the Scottish Intercollegiate Guidelines Network (SIGN, 115). A favourable opinion was then awarded (see appendix 6).

A note of substantial amendment was subsequently submitted in February 2012 to the Ethics Committee requesting the inclusion of children in Primary 5 (this did not affect the age of inclusion which remained 9-11 years old). This amendment was given approval (see Appendix 7). A further note of substantial amendment was later submitted in September 2012 to include children aged 8-12 years old. This was again given approval (see Appendix 6). Permission was also sought from Research and Development who advised that permission was not required (see Appendix 5).

Main ethical considerations

During project planning a number of main ethical issues were considered. The first concern was consent. As the issue of obesity can be a sensitive issue it was felt that it was important to gain consent from parents as well as children and therefore an opt-in form of recruitment was utilised.

A further issue of ethical concern which was considered was attempting to prevent any stigma involved in the completion of the study. Therefore the study only took place in schools if there were at least two children taking part. Children were invited to complete the measures even if their data needed to be excluded from the study due to co-morbid health

conditions or other reasons in order that they were not potentially seen as different or stigmatised and this data was later removed.

Finally consideration was given to appropriate steps to be followed should a child become distressed or report anything which was deemed cause for concern. It was agreed that should a child become distressed the class teacher would be alerted at which point they would deal with this according to their school policy. If a child reported something which was a cause for concern local protocols for contacting child protection would be followed.

Study sites

The study was completed in conjunction with the Paediatric Overweight Service Tayside (POST). The POST service is a dietetic run child weight management service set up in Tayside to provide education and treatment in relation to weight management. The Paediatric Over-weight Service Tayside or POST was established in 2009. POST is a government funded service working towards the Scottish governments HEAT 3 (child healthy weight) target, by providing a family based weight management service. POST uses an evidence based programme developed by Stewart *et al.*, (2005), the Scottish Childhood Obesity Treatment Trial (SCOTT). The programme is clinic based and delivered by experienced health professionals. POST are a Tayside wide service encompassing Perth & Kinross, Dundee and Angus and is aimed at children aged two to sixteen years old⁶. The service provides clinic based treatment of children who are either self-referred or referred by

⁶ The family based weight management service will be hereafter referred to as the clinic intervention.

someone working with them, whose BMI is above the 98th centile. As part of this service the height and weight of all children receiving treatment is taken. The POST service also provide a school based intervention for children in Primary 5,6 and 7 of Primary Schools across Tayside who have agreed to take part in this service. This intervention known as “funfittayside” provides education on healthy lifestyles including diet and exercise for the children involved⁷. The programme is aimed at children of all weights and does not focus solely on overweight or obese children. As part of this service the height and weight of all children receiving treatment is taken.

Exclusion criteria

Participants were excluded from the current study if they had a pre-existing significant chronic health condition (for example diabetes which is known to affect quality of life), if the child was unable to read or write (help was provided to any children where necessary who had some reading and writing skills), if the child had a diagnosed learning disability for which the scales being used were not validated or if they were not fluent in English.

Measures

Body Mass Index

Although BMI has received much criticism it remains the main recommended method for measuring weight in children. Body Mass Index was measured by trained POST clinicians both for the clinic intervention and the school intervention. Weight and height were measured using a calibrated balance beam and scales. This was converted using the weight

⁷ The school based “funfittayside” will be hereafter referred to as the school intervention.

kg/height M^2 . This was then classified using BMI centile charts which are adjusted for age and sex. However as some of the children within the sample were known to have BMI of above 100th Centile BMI standard Deviation (SD) was chosen as the measurement for analysis. This is widely recommended for weight classification (e.g. SIGN, 2010, Dinsdale *et al.*, 2011).

Quality of Life

Quality of Life was assessed using the Paediatric Quality of Life Inventory (PedsQL) (Varni, 1998). This is a self-report measure assessing health related quality of life in relation to specific conditions. Participants are asked to complete this 23 item scale rating how much something has been a problem for them in the previous month. The questionnaire uses a 5 point Likert scale where participants rate whether something has, ‘never’, ‘almost never’, ‘sometimes’, ‘often’ or ‘almost always’ been a problem. The PedsQL consists of four domains, physical, emotional, social and school. Participants answer a variety of questions which tap into each of these domains. For example, “I feel tired”(physical), “I feel sad” (emotional), “Other children tease me” (social), “I forget things” (School). The PedsQL provides subscale scores and an overall score of quality of life which was chosen for the purposes of this study. The PedsQL is a widely used measure with good reliability and validity with an internal consistency reliability for the Total Scale Score of $\alpha=0.83$. This scale has been used in a variety of research including in children with diabetes (Varni *et al.*, 2003), as a school health measure (Varni *et al.*, 2006) and also in the obesity population (e.g. Pinhas-Hamiel *et al.*, 2006, Williams *et al.*, 2005), with no adverse effects identified.

Resiliency Scales for Children and Adolescents

Resiliency was measure using Resiliency Scales for Children and Adolescents (Prince-Embury, 2008). This scale measures three different aspects of personal resilience, sense of mastery, sense of relatedness and emotional reactivity asking the child to rate themselves. Children rate themselves on a 5 point Likert scale rating questions as ‘never’, ‘rarely’, ‘sometimes’, ‘often’, ‘almost always’. Questions tap into each of the three constructs for example, “Life is fair” (sense of mastery), “People like me” (sense of relatedness), “it is easy for me to get upset” (emotional reactivity). The results are then combined to provide an overall score for Resourcefulness and for Vulnerability. Resourcefulness takes into account both the sense of mastery and sense of relatedness and Prince-Embury suggests that the development of these depends on a child’s development of strength though interacting with their environment – giving an overall summary of a child’s positive strengths in relation to resilience. The Vulnerability Scale is defined as the discrepancy between the child’s emotional reactivity and their perceived personal resources. The Resiliency Scale has been found to be reliable and valid (Prince-Embury & Steer, 2010), with internal consistency found at .91 for the Resource Index and .86 for the Vulnerability Index (Prince-Embury, 2010). The scale has been used in a variety of research settings including with children who have Aspergers (Montgomery *et al.*, 2008), in adolescent psychiatric inpatients (Kumar *et al.*, 2010), in juvenile offenders (Mowder *et al.*, 2010) with no adverse effects but as yet has not been used in research looking at childhood obesity.

Self-Esteem

Self-esteem was assessed using the Self Image Profile for Children (SIP-C) (Butler, 2001). A self-report measure asking children to rate themselves on a 7 point Likert scale from 0 - not

at all like me, to 6 – very much like me. Children are asked to rate themselves twice, once for "how they think they are" and then again for "how they would like to be", with the discrepancy between the scores giving a global score for self-esteem. This has been found to be a reliable and valid measure (Butler & Gasson, 2005). This was developed in the UK but has been used in a variety of settings including evaluating school counselling (Truneckova & Viney, 2008) and looking at school bullying (Kaloyirou & Lindsay, 2008) with no adverse effects. Although the SIP-C has as yet not been used with obesity population it has found to be highly correlated with the Harter Self-Perception Profile which has been used routinely in this population (Butler, 2001). For analysis the global self-esteem score was made negative as the score represents a difference.

General Demographics

Children were also asked to answer some general questions on their activity levels and time spent in front of the screen (television, computer etc). These questions were developed by the chief investigator (see Appendix 12). Although individual address information was not collected the postcode of the school was collected as a proxy measure in order to calculate socio-demographic information.

Procedure

As recruitment from the school intervention and the clinic intervention involved different procedures these will be described separately.

School intervention

Following receipt of permission from the two Education Authorities involved (see Appendix 4⁸), all Primary Schools involved in the school intervention were invited to take part in the study and sent information regarding this. This was then followed up by telephone call or email. Schools who expressed interest were offered the opportunity to discuss the research further with the chief investigator directly or have the chief investigator present more information to them. The chief investigator also gave several presentations regarding the study at events held by POST regarding the school intervention. Ten schools agreed to take part in the study. Once a school agreed to take part, the pupils in Primary 5,6 or 7 (aged 8-12 years old) who were taking part in the school intervention were given an information pack to take home to their parent/guardian. This included an information sheet outlining the research, a copy of the participant information sheet which the child would later receive and a consent form (including contact details and complaint details) and a return stamped addressed envelope (see appendix 9 & 11). At this point the chief investigator had no access to any details about the child. Parents/Guardians were given at least two weeks to consider the study and return the consent form by mail directly to the chief investigator.

The chief investigator attended participating schools during the final session of the school intervention or at another time mutually agreed by both the CI and the school. The final session of the school intervention was chosen as children were moving around between classes during this session to have their heights and weights taken. This meant it was not obvious when children were away taking part in the current study, again preventing any

⁸ Permission was also granted by Dundee local authority but as the children taking part in the school intervention within this area were out with the range included in the study these schools were not included.

stigma. Participants who had been given written consent to take part were gathered together and taken to a quiet area to complete questionnaires. Participants were asked to read the participant information leaflet and given the opportunity to complete the consent form should they wish to take part. It was reinforced that they were not obliged to take part and could pull out at any point with no adverse consequences and their data would be destroyed. Any participant with difficulties reading or writing was given assistance with this. Efforts were taken to ensure that children understood that they did not have to participate and to ensure that they would not be identified as not having taken part. Participants who had a health condition which may have affected their answers (e.g. diabetes where information about this was gathered by the CI from the class teacher) were allowed to complete the study to reduce the chance of stigma but their details were later excluded and subsequently destroyed. This was not disclosed to them. The CI remained with the children whilst they completed the questionnaires in order to provide any further assistance which may be required or in case a child should become distressed.

Having previously sought written consent from parents/guardians, height and weight information was accessed following the study from the POST service who had taken this as part of the school intervention. This was matched to the questionnaire data using a unique identified as questionnaires had been anonymised. No child was given personal information about the results of their or anyone else's questionnaires.

Clinic intervention

POST practitioner's identified any children within the clinic intervention who were aged 8-12 years old and met the inclusion criteria. The parent/guardian of these children were given the information packs during a session of their clinic intervention. It was made clear that whether they chose to participate or not would not affect their NHS care in any way. At this point no personal information was given to the chief investigator. Information packs contained similar information to that given to the school children although the wording was specifically related to the clinic intervention (see Appendix 8 & 10). Parents/guardians were again given at least two weeks in which to consider the project and return the consent form to the POST practitioner.

If the parent/guardian consented to the child taking part in the study and returned the consent form the child would be given the opportunity to complete the consent form should they wish to take part. It was reinforced that they were not obliged to take part and could pull out at any point with no adverse consequences. This took place during a subsequent routine clinic intervention appointment. The POST practitioners were fully briefed on the questionnaires and able to provide assistance in exactly the same way as the CI. The POST practitioner again reinforced that the participant was free to withdraw from the study at any point with no adverse consequences. The questionnaires were then returned to the CI.

The chief investigator gained access to BMI information which was gathered and calculated by the POST practitioners. This information was collected routinely by the POST

practitioners as part of governmental HEAT targets. This information was then matched with participant information.

All questionnaire packs for both the school intervention and the clinic intervention were stored only after being anonymised. In line with the ethical approval, details were stored in a locked filing cabinet in an NHS building where they will remain for three years at which time they will be destroyed.

Power Calculations and Statistical Analysis

The statistical power of a test is the ability to identify an effect in a sample when it occurs. In order to determine the minimum sample size required to produce the estimated effect size and to reduce the chance of a type II error, power calculations were carried out a priori. Previous research looking at BMI and quality of life found a large effect size, comparing overweight/obese children with normal weight children. It is therefore reasonable to expect around a medium effect size (Schiwimmer *et al.*, 2003) and this was therefore used in determining power for self-esteem analysis. Research looking at self-esteem and BMI has found a medium effect size (Griffiths *et al.*, 2010) and therefore this was used in calculating power. As previous research has indicated a significant relationship between an increase in BMI and a reduction in quality of life the current study aimed to assess whether resilience would moderate this relationship. As moderation is based on regression analysis, a power calculation using G*Power (Faul *et al.*, 2007) suggested that for a medium effect size of 0.2 with statistical power of 0.8 at an alpha level of .05 a minimum of 81 participants would be

required with five predictor variables (BMISD, resourcefulness, vulnerability and two interaction terms).

The initial plan for analysis was to compare children over three groupings calculated for BMI, normal weight which comprised the 2nd -90.0th centile, overweight which included 91st -97.9th centile and obese which were children above the 98th centile. The study aimed to investigate the differences in quality of life and self-esteem and quality of life between the three categories of weight. The study also aimed to investigate the relationship between BMI, resilience, quality of life and self-esteem between the three groups. However after the initial data collection period the response rate was significantly lower than expected. It was noted that there was a gap in the literature where relationships between BMI and both self-esteem and quality of life were investigated on a continuum. Therefore the analysis was revised to complete correlation and regression analyses based on all the children involved in the study, rather than comparing different groups based on BMI.

Raw data from the questionnaires were scored and entered into Statistical Package for the Social Sciences (SPSS) version 19.0 for Windows. Eleven data sets were incomplete with missing details, either BMI data or questionnaires having not been completed. The decision was taken to delete these missing data sets leaving an overall number of complete data sets of 82, which was sufficient to achieve power. In the first instance descriptive statistics were used to analyse socio-demographic information. Data was also inspected for outliers (deemed more than 2 standard deviations from the mean) and none were detected (Field, 2013). For initial correlation analysis normality of the data was inspected both visually using histograms and by inspecting values for Kurtosis and skewness. Several of the

variables were found to be subject to both. Initially data transformation was attempted but as this was unsuccessful non-parametric statistics were chosen. Mann-Whitney U tests were completed to determine any significant differences between males and females for both quality of life and self-esteem. No significant differences were established and therefore all data was analysed together. Due to the small sample of participants taking part from the clinic sample all data was analysed together.

Correlations were then conducted to determine any associations between BMI, Quality of Life, Self-esteem, Self-Concept and Resilience. For the moderation analysis which was based on hierarchical multiple regression only the residuals are required to be normally distributed (Tabachnick & Fidell, 2007, Todman & Dugard, 2007). These were inspected using histograms scatterplots to assess for homoscedasticity and linearity. Tests of multicollinearity were also conducted and values were centred.

Thesis References

- Aldridge, J., & Becker, S. (2003). *Children caring for parents with mental illness: Perspectives of young carers, parents and professionals*. MIT Press.
- Alvord, M. K., & Grados, J. J. (2005). Enhancing Resilience in Children: A Proactive Approach. *Professional psychology: research and practice*, 36(3), 238.
- Anderson, S. E., Gooze, R. A., Lemeshow, S., & Whitaker, R. C. (2012). Quality of early maternal–child relationship and risk of adolescent obesity. *Pediatrics*, 129(1), 132-140.
- Björntorp, P., & Rosmond, R. (2000). Obesity and cortisol. *Nutrition*, 16(10), 924-936.
- Bose, M., Oliván, B., & Laferrère, B. (2009). Stress and obesity: the role of the hypothalamic–pituitary–adrenal axis in metabolic disease. *Current opinion in endocrinology, diabetes, and obesity*, 16(5), 340.
- Bowlby, J. (1969). *Attachment and loss, volume i: Attachment*.
- Butler, R.J., & Gasson, S.L. (2005). Self esteem/self concept scales for children and adolescents: A review. *Child and Adolescent Mental Health*, 10(4), 190-201.
- Butler, R.J. (2001). *The Self-Image Profiles for Children (SIP-C) and Adolescents (SIP-A) Manual*. London: The Psychological Corporation.

Carr, A. (2005). *The handbook of child and adolescent clinical psychology: A contextual approach*. Routledge.

Carr A, McNulty C. (2007). Normal psychological development in adulthood. In: Carr, A. *The handbook of child and adolescent clinical psychology: A contextual approach*.p 3-41
Routledge. London

Cole, T.J., Bellizzi, M.C., Flegal, K.M., & Dietz, W.H. (2000). Establishing a standard definition for child overweight and obesity worldwide: international survey. *British Medical Journal*, 320(7244), 1240.

Coolbear, J., & Benoit, D. (1999). Failure to thrive: Risk for clinical disturbance of attachment?. *Infant Mental Health Journal*, 20(1), 87-104.

Cornette, R. (2008). The emotional impact of obesity on children. *Worldviews on Evidence-Based Nursing*, 5(3), 136-141.

Davis, M., Young, L., Davis, S.P., & Moll, G. (2008). Parental depression, family functioning and obesity among African American children. *Journal of Cultural Diversity*, 16(2), 61.

Decaluwé, V., Braet, C., Moens, E., & Van Vlierberghe, L. (2006). The association of parental characteristics and psychological problems in obese youngsters. *International Journal of Obesity*, 30(12), 1766-1774.

Dinsdale, H., Ridler, C., & Ells, L.J. (2011). A simple guide to classifying body mass index in children. National Obesity Observatory, Oxford.

Dodge, K. A. (1990). Developmental psychopathology in children of depressed mothers. *Developmental Psychology*, 26(1), 3.

Duniz, M., Scheer, P. J., Trojovsky, A., Kaschnitz, W., Kvas, E., & Macari, S. (1996). Changes in psychopathology of parents of NOFT (non-organic failure to thrive) infants during treatment. *European child & adolescent psychiatry*, 5(2), 93-100.

Dunne, L., Sneddon, H., Iwaniec, D., & Stewart, M. C. (2007). Maternal mental health and faltering growth in infants. *Child Abuse Review*, 16(5), 283-295.

Epstein, L.H., Klein, K.R., & Wisniewski, L. (1994). Child and parent factors that influence psychological problems in obese children. *International Journal of Eating Disorders*, 15(2), 151-158.

Epstein, L.H., Myers, M.D., & Anderson, K. (1996). The association of maternal psychopathology and family socioeconomic status with psychological problems in obese children. *Obesity Research*, 4(1), 65-74.

Epstein, L.H., Wisniewski, L., & Weng, R. (1994). Child and parent psychological problems influence child weight control. *Obesity research*, 2(6), 509-515.

Faul, F., Erdefelder, E., & Lang, A.G. (2007). G*Power 3: a flexible statistical power analysis program for the social, behavioural and biomedical sciences. *Behavior Research Methods*, 39(2), 175-191.

Field, A. (2013). *Discovering statistics using IBM SPSS statistics*. London: Sage Publications Ltd.

Franklin, J., Denyer, G., Steinbeck, K.S., Caterson, I.D., & Hill, A.J. (2006). Obesity and risk of low self-esteem: a statewide survey of Australian children. *Pediatrics*, 118(6), 2481-2487.

Frazier, P.A., Tix, A.P., & Barron, K.E. (2004). Testing moderator and mediator effects in counseling psychology research. *Journal of Counselling Psychology*, 51(1), 115.

Gerhard, S. (2004). *Why love matters. How affection shapes a baby's brain*. Hove, East Sussex, NY: Brunner-Routledge.

Goldschmidt, A.B., Sinton, M.M., Aspen, V.P., Tibbs, T.L., Stein, R.I., Saelens, B.E. *et al.* (2010). Psychosocial and familial impairment among overweight youth with social problems. *International Journal of Pediatric Obesity*, 5(5), 428-435.

Goodman, E.(2008). Socioeconomic Factors Related to Obesity in Children and Adolescents. In Jelalian E, Steele RG. Editors. *Handbook of Childhood and Adolescent Obesity, Issues in Clinical Child Psychology*. Springer Science, New York. P127-143.

Goodyer, I. M., Tamplin, A., Herbert, J., & Altham, P. M. E. (2000). Recent life events, cortisol, dehydroepiandrosterone and the onset of major depression in high-risk adolescents. *The British Journal of Psychiatry*, 177(6), 499-504.

Gray L., & Leyland A.H. (2012). Obesity. In Rutherford L., Sharp C., & Bromley C., (Eds.). *The Scottish Health Survey 2011 volume 2: children*.(pp.101-115). Edinburgh: The Scottish Government Health Directorate.

Griffiths, L.J., Parsons, T.J., & Hill, A.J. (2010). Self-esteem and quality of life in obese children and adolescents: A systematic review. *International Journal of Pediatric Obesity*, 5(4), 282-304.

Halligan, S. L., Herbert, J., Goodyer, I. M., & Murray, L. (2004). Exposure to postnatal depression predicts elevated cortisol in adolescent offspring. *Biological psychiatry*, 55(4), 376-381.

Harter, S. (2006). The self. In W. Damon, R.M Lerner, N.D. Eisenberg (Eds). *Handbook of Child Psychology. Vol 3. Social Emotional & Personality Development*. 6th Edition. pp505-570. Hoboken. NJ: John Wiley & Sons.

Haslam, D. (2007). Obesity: a medical history. *Obesity Reviews*, 8(s1), 31-36.

Hesketh, K., Wake, M., & Waters, E. (2004). Body mass index and parent-reported self-esteem in elementary school children: evidence for a causal relationship. *International Journal of Obesity*, 28(10), 1233-1237.

Howes C. (1999) Attachment relationships to multiple caregivers. In: Cassidy J, Shaver PR. (Ed). *Handbook of attachment: Theory, research, and clinical applications. Rough Guides*. p671-687.

Hughes, A.R., Farewell, K., Harris, D., & Reilly, J.J. (2006). Quality of life in a clinical sample of obese children. *International Journal of Obesity*, 31(1), 39-44.

Isnard, P., Quantin, L., Cortese, S., Falissard, B., Musher-Eizenman, D., Guedeney, A. *et al.* (2010). Bulimic behaviours and psychopathology in obese adolescents and in their parents. *International Journal of Pediatric Obesity*, 5(6), 474-482.

Jansen, E., Mulkens, S., & Jansen, A. (2011). Tackling childhood overweight: treating parents exclusively is effective. *International Journal of Obesity*, 35(4), 501-509.

Kaloyirou, C., & Lindsay, G. (2008). The self-perceptions of bullies in Cyprus primary schools. *European Journal of Special Needs Education*, 23(3), 223-235.

Kyrou, I., Chrousos, G. P., & Tsigos, C. (2006). Stress, visceral obesity, and metabolic complications. *Annals of the New York Academy of Sciences*, 1083(1), 77-110.

Kumar, G., Steer, R.A., & Gulab, N.A. (2010). Resiliency Profiles of child and adolescent psychiatric inpatients. *Journal of Psychoeducational Assessment*, 26(4), 315-326.

Lawford, J., & Eiser, C. (2001). Exploring links between the concepts of Quality of Life and resilience. *Developmental Neurorehabilitation*, 4(4), 209-216.

Li, W., & Rukavina, P. (2009). A review on coping mechanisms against obesity bias in physical activity/education settings. *Obesity Reviews*, 10(1), 87-95.

Luppino, F. S., de Wit, L. M., Bouvy, P. F., Stijnen, T., Cuijpers, P., Penninx, B. W., & Zitman, F. G. (2010). Overweight, obesity, and depression: a systematic review and meta-analysis of longitudinal studies. *Archives of general psychiatry*, 67(3), 220-229.

Luthar, S. S., Cicchetti, D., & Becker, B. (2000). The construct of resilience: A critical evaluation and guidelines for future work. *Child development*, 71(3), 543-562.

Markowitz, S., Friedman, M. A., & Arent, S. M. (2008). Understanding the relation between obesity and depression: causal mechanisms and implications for treatment. *Clinical Psychology: Science and Practice*, 15(1), 1-20.

Masten, A. S., & Coatsworth, J. D. (1998). The development of competence in favorable and unfavorable environments: Lessons from research on successful children. *American psychologist*, 53(2), 205.

Mokhtar, N., Elati, J., Chabir, R., Bour, A., Elkari, K., Schlossman, N.P. *et al.* (2001). Diet culture and obesity in northern Africa. *The Journal of Nutrition*, 131(3), 887S-892S.

Montgomery, J.M., Schwean, V.L., Burt, J.G., Dyke, D.I., Thorne, K.J., Hindes, Y.L. *et al.* (2008). Emotional intelligence and resiliency in young adults with Asperger's disorder: Challenges and opportunities. *Canadian Journal of School Psychology*, 23(1), 70-93.

Mordoch, E., & Hall, W.A. (2002). Children living with a parent who has a mental illness: a critical analysis of the literature and research implications. *Archives of Psychiatric Nursing*, 16(5), 208-216.

Mowder, M.H., Cummings, J.H. & McKinney, R. (2010). Resiliency Scales for Children and Adolescents: Profiles of juvenile offenders. *Journal of Psychoeducational Assessment*, 28(4), 326-337.

Myers, M.D., Raynor, H.A., & Epstein, L.H. (1998). Predictors of child psychological changes during family-based treatment for obesity. *Archives of Pediatrics & Adolescent Medicine*, 152(9), 855.

Nachmias, M., Gunnar, M., Mangelsdorf, S., Parritz, R. H., & Buss, K. (1996). Behavioral inhibition and stress reactivity: The moderating role of attachment security. *Child development*, 67(2), 508-522.

O'Brien, L. M., Heycock, E. G., Hanna, M., Jones, P. W., & Cox, J. L. (2004). Postnatal depression and faltering growth: a community study. *Pediatrics*, 113(5), 1242-1247.

Oyserman D, Bybee D, Mowbray C. Influences of maternal mental illness on psychological outcomes for adolescent children. *J Adolesc.* 2002; 25,6: 587-602

Parkes, A., Sweeting, H., & Wight, D. (2012). *Growing Up in Scotland: Overweight, obesity and activity*. Edinburgh: Scottish Government.

Phillips, B.A., Gaudette, S., McCracken, A., Razzaq, S., Sutton, K., Speed, L. *et al.* (2012). Psychosocial functioning in children and adolescents with extreme obesity. *Journal of Clinical Psychology in Medical Settings*, 19(3), 277-284.

Pinhas-Hamiel, O., Singer, S., Pilpel, N., Fradkin, A., Modan, D., & Reichman, B. (2005). Health-related quality of life among children and adolescents: associations with obesity. *International Journal of Obesity*, 30(2), 267-272.

Prince-Embury, S. (2008). The resiliency scales for children and adolescents, psychological symptoms, and clinical status in adolescents. *Canadian Journal of School Psychology*, 23(1), 41-56.

Prince-Embury, S., & Steer, R.A. (2010). Profiles of Personal Resiliency for Normative and Clinical Samples of Youth Assessed by the Resiliency Scales for Children and Adolescents. *Journal of Psychoeducational Assessment*, 28(4), 303-314.

Puhl, R., & Brownell, K.D. (2003). Ways of coping with obesity stigma: review and conceptual analysis. *Eating Behaviors*, 4(1), 53-78.

- Reilly, J.J. (2010). Assessment of obesity in children and adolescents: synthesis of recent systematic reviews and clinical guidelines. *Journal of Human Nutrition and Dietetics*, 23(3), 205-211.
- Reilly, J.J., Methven, E., McDowell, Z.C., Hacking, B., Alexander, D., Stewart, L. *et al.* (2003). Health consequences of obesity. *Archives of Disease in Childhood*, 88(9), 748-752.
- Renzaho, A. (2004). Fat, rich and beautiful: changing socio-cultural paradigms associated with obesity risk, nutritional status and refugee children from sub-Saharan Africa. *Health & Place*, 10(1), 105-113.
- Reupert, A., & Maybery, D. (2007). Families affected by parental mental illness: A multiperspective account of issues and interventions. *American Journal of Orthopsychiatry*, 77(3), 362-369.
- Riazi, A., Shakoor, S., Dundas, I., Eiser, C., & McKenzie, S.A. (2010). Health-related quality of life in a clinical sample of obese children and adolescents. *Health and Quality of Life Outcomes*, 8(1), 134.
- Robins, R. W., Trzesniewski, K. H., Tracy, J. L., Gosling, S. D., & Potter, J. (2002). Global self-esteem across the life span. *Psychology and aging*, 17(3), 423.
- Russell-Mayhew, S., McVey, G., Bardick, A., & Ireland, A. (2012). Mental health, wellness, and childhood overweight/obesity. *Journal of Obesity*, 2012.

Schwimmer, J.B., Burwinkle, T.M., & Varni, J.W. (2003). Health-related quality of life of severely obese children and adolescents. *JAMA: the Journal of the American Medical Association*, 289(14), 1813-1819.

Scottish Intercollegiate Guidelines Network (2011). *SIGN 50. A guideline developer's handbook*. Edinburgh: Scottish Intercollegiate Guidelines Network.

Scottish Intercollegiate Guidelines Network (2010). *SIGN 115. Management of Obesity. A national clinical guideline*. Edinburgh: Scottish Intercollegiate Guidelines Network.

Smith, M. (2004). Parental mental health: disruptions to parenting and outcomes for children. *Child & Family Social Work*, 9(1), 3-11.

Steele, R.G., Nelson, T.D., & Jelalian, E. (2009). Pediatric obesity: Trends and epidemiology. In Jelalian, E. & Steele, R.G. (Eds.). *Handbook of childhood and adolescent obesity* (pp.3-10). New York: Springer.

Stewart-Knox, B., Duffy, M.E., Bunting, B., Parr, H., de Almeida, M.D.V., & Gibney, M. (2012). Associations between obesity (BMI and waist circumference) and socio-demographic factors, physical activity, dietary habits, life events, resilience, mood, perceived stress and hopelessness in healthy older Europeans. *BMC public health*, 12(1), 424.

Swinburn, B.A., Sacks, G., Hall, K.D., McPherson, K., Finegood, D.T., Moodie, M.L. *et al.* (2011). The global obesity pandemic: shaped by global drivers and local environments. *The Lancet*, 378(9793), 804-814.

Tarullo, A. R., & Gunnar, M. R. (2006). Child maltreatment and the developing HPA axis. *Hormones and behavior*, 50(4), 632-639.

Thompson R.A., Meyer, S. (2007). The socialization of emotion regulation in the family. In Gross J. editor. *Handbook of emotion regulation*. New York, NY. Guildford Press. p249-268.

Todman, J.B., & Dugard, P. (2007). *Approaching multivariate analysis: An introduction for psychology*. New York: Psychology Press.

Truneckova, D. & Viney, L.L. (2008). Small-group counselling with primary school children. *Personal Construct Theory & Practice*, 5, 139-148.

Trzesniewski, K.H, Donnellan B, & Robins, R.W. (2013). Development of self esteem. In V. Zeigler-Hill. *Self-Esteem. Current issues in Social Psychology*. pp 60-80. Psychology Press. Hove. East Sussex.

Tsiros, M.D., Olds, T., Buckley, J.D., Grimshaw, P., Brennan, L., Walkley, J. *et al.* (2009). Health-related quality of life in obese children and adolescents. *International Journal of Obesity*, 33(4), 387-400.

Ul-Haq, Z., Mackay, D.F., Fenwick, E., & Pell, J.P. (2013). Meta-analysis of the association between body mass index and health-related quality of life among children and adolescents, assessed using the Pediatric Quality of Life Inventory Index. *The Journal of Pediatrics* 162(2), 280-286.

Varni (1998). The PedsQLTM Measurement model for the Pediatric Quality of Life Inventory. <http://www.pedsql.org/pedsql12.html>

Varni, J.W., Burwinkle, T.M., & Seid, M. (2006). The PedsQLTM 4.0 as a school population health measure: Feasibility, reliability, and validity. *Quality of life research*, 15(2), 203-215.

Varni, J.W., Burwinkle, T.M., Jacobs, J.R., Gottschalk, M., Kaufman, F., & Jones, K.L. (2003). The PedsQL™ in Type 1 and Type 2 Diabetes Reliability and validity of the Pediatric Quality of Life Inventory™ Generic Core Scales and Type 1 Diabetes Module. *Diabetes care*, 26(3), 631-637.

Vila, G., Zipper, E., Dabbas, M., Bertrand, C., Robert, J.J., Ricour, C., & Mouren-Siméoni, M.C. (2004). Mental disorders in obese children and adolescents. *Psychosomatic Medicine*, 66(3), 387-394.

Vivier, P., & Tompkins, C (2008). Health consequences of obesity in Children and Adolescents. In Jelalian, E., Steele, R.G. (Eds). *Handbook of childhood and adolescent obesity*. (pp.11-24). New York: Springer.

Vostanis, P., Graves, A., Jenkins, R., & Brugha, T. (2006). Relationship between parental psychopathology, parenting strategies and child mental health. *Social Psychiatry and Psychiatric Epidemiology*, 41(7), 509-514.

Wallander, J.L., Kerbawy, S., Toomey, S., Lowry, R., Elliott, M.N., Escobar-Chaves, S.L. *et al.* (2013). Is obesity associated with reduced health-related quality of life in Latino, black and white children in the community? *International Journal of Obesity*, 37(7), 920-925.

Wardle, J., & Cooke, L. (2005). The impact of obesity on psychological well-being. *Best Practice & Research Clinical Endocrinology & Metabolism*, 19(3), 421-440.

Williams, J.W., Canterford, L., Hesketh, K.D., Hardy, P., Waters, E.B., Patton, G.C. *et al.* (2011). Changes in body mass index and health related quality of life from childhood to adolescence. *International journal of pediatric obesity*, 6(2-2), e442-e448.

Williams, J., Wake, M., Hesketh, K., Maher, E., & Waters, E. (2005). Health-related quality of life of overweight and obese children. *JAMA: the journal of the American Medical Association*, 293(1), 70-76.

Wu, X.Y., Ohinmaa, A., & Veugelers, P.J. (2011). Diet quality, physical activity, body weight and health-related quality of life among grade 5 students in Canada. *Cognitive Development*, 6, 8.

Yi, J. P., Vitaliano, P. P., Smith, R. E., Yi, J. C., & Weinger, K. (2008). The role of resilience on psychological adjustment and physical health in patients with diabetes. *British Journal of Health Psychology*, 13(2), 311-325.

Zeanah, C. H., Berlin, L. J., & Boris, N. W. (2011). Practitioner Review: Clinical applications of attachment theory and research for infants and young children. *Journal of Child Psychology and Psychiatry*, 52(8), 819-833.

Zeller, M.H., Saelens, B.E., Roehrig, H., Kirk, S., & Daniels, S.R. (2004). Psychological adjustment of obese youth presenting for weight management treatment. *Obesity Research*, 12(10), 1576-1586.

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Appendix 1 – Author Guidance for Systematic Review Journal

International Journal of Paediatric Obesity

2010 Impact Factor: 2.654

5-year Impact Factor: 3.819

Ranking: 15/107 (Pediatrics)

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Aims And Scope

The *International Journal of Pediatric Obesity* is a new, peer-reviewed, bi-monthly journal devoted to research into obesity during childhood and adolescence. The topic is currently at the centre of intense interest in the scientific community, and is of increasing concern to health policy-makers and the public at large.

The aim of the International Journal of Pediatric Obesity is to rapidly establish itself as the leading journal for high quality papers including, but not limited to, the following:

- Genetic, molecular, biochemical and physiological aspects of obesity – basic, applied and clinical studies
- Metabolic consequences of child and adolescent obesity
- Epidemiological and population-based studies of child and adolescent overweight and obesity
- Measurement and diagnostic issues in assessing child and adolescent adiposity, physical activity and nutrition
- Clinical management of overweight and obese children and adolescents
- Co-morbidities linked to child and adolescent obesity – mechanisms, assessment, and treatment
- Life-cycle factors eg familial, intrauterine and developmental aspects of child and adolescent obesity
- Nutrition security and the "double burden" of obesity and malnutrition
- Health promotion strategies around the issues of obesity, nutrition and physical activity in children and adolescents
- Community and public health measures to prevent overweight and obesity in children and adolescents

International Journal of Pediatric Obesity is available in both print and online versions. The journal also publishes supplements in the same style and layout as that of a regular issue of the journal. Supplements may be commercial or non-commercial. Please contact the Editorial Office at ijpo@iaso.org for more information

The journal is owned by the International Association for the Study of Obesity, a not-for-profit charitable body linking over 50 regional and national associations with over 10,000 professional members in scientific, medical and research organisations.

2009 Impact Factor: 2.186*

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Abstracting & Indexing

Indexed/abstracted in: Biological Abstracts; Calcified Tissue Abstracts; Chemical Abstracts; Current Advances in Ecological and Environmental Sciences; Current Contents/Clinical Medicine; Current Titles in Dentistry; EMBASE/Excerpta Medica; Energy Research Abstracts; Index Medicus/MEDLINE; Index to Dental Literature; INIS Atomindex; International Journal of Dental Abstracts; Medical Documentation Service; PEDro; Periodicals Scanned and Abstracted. Life Sciences Collection; Science Citation Index; SciSearch.

Instructions for Authors

General Editorial Policy

Submitted manuscripts are subject to editorial review and are received with the explicit understanding that they are not under simultaneous consideration by any other publication. Submission of a manuscript to the International Journal of Pediatric Obesity is taken as evidence that no portion of the text or figures has been copyrighted, published, or submitted for publication elsewhere, unless information regarding previous publication is explicitly cited and permission obtained. A copy of such permission must accompany the submitted manuscript.

Requirements for manuscript submission are in accordance with the 'Uniform Requirements for Manuscripts Submitted to Biomedical Journals', as presented at <http://www.ICMJE.org/>

Reports concerning studies involving human or animal test subjects should include a statement regarding approval of an institutional ethics committee.

Acceptance

The *acceptance criteria* for all papers are the quality and originality of the research and its significance to the readership. Except where otherwise stated, manuscripts are peer reviewed by two anonymous reviewers and the Editors. Editors reserve the right to refuse any material for publication and final acceptance or rejection rests with the Editors. Manuscripts rejected for publication will not be returned.

Process of Submission

All submissions should be made online at the International Journal of Pediatric Obesity's Manuscript Central site found at <http://mc.manuscriptcentral.com/ijpo>. New users should first create an account. Once a user is logged onto the site submissions should be made via the Author Centre. All authors must give consent to publication and disclose potential conflicts of interest. The conflicts of interest statement should disclose funding sources, relevant patents, financial and business relationships to sponsors, companies related to the research or the outcome of the studies in the manuscript

Copyright

It is a condition of publication that authors assign copyright or license the publication rights in their articles, including abstracts, to the International Association for the Study of Obesity. This enables us to ensure full copyright protection and to disseminate the article, and of course the Journal, to the widest

possible readership in print and electronic formats as appropriate. All authors must read and agree to the conditions outlined in the Copyright Assignment Form, and must sign the Form. This form will be sent out at the time of acceptance of the manuscript, and should be returned as soon as possible to Informa Healthcare.

Authorship

Authorship credit should be based only on substantial contribution to:

- Conception and design, or analysis and interpretation of data
- Drafting the article or revising it critically for important intellectual content And
- Final approval of the version to be published.

All these conditions must be met. Participation solely in the acquisition of funding or the collection of data does not justify authorship. Any list of more than 6 authors should be justified to the Editors.

Types of Manuscripts

The following types of articles are published in the International Journal of Pediatric Obesity:

Original Articles which report on clinical, population health and laboratory investigations and observations from both human and animal studies in all areas relevant to the broad area of child and adolescent obesity. Manuscripts should be between 1,500 and 5,000 words in length (i.e. up to 20 typewritten double-spaced pages), including tables, figure legends, and references necessary to support the data and their interpretation. Manuscripts should generally follow the IMRAD (Introduction, Methods, Results, Discussion) format. They should include hypothesis testing, appropriate statistical methods, a clear reporting of results, and conclusions that are supported by the results.

Short Communications Studies that fall short of the criteria for full research papers (e.g. preliminary experiments limited by sample size or duration, novel hypotheses, commentaries) may be submitted as Short Communications. They should generally contain no more than 1,000 words of text, a maximum of two display items (tables and/or figures) and a maximum of 20 references. Apart from the Abstract (one paragraph of maximum 150 words) and Keywords, the text does not need to be divided into sections. In all other respects, the directions for full papers should be followed.

Review Articles Please contact the Editor-in-Chief before submission of a review article in order to ensure that the proposed topic falls within the journal guidelines and that a review on that topic is not currently under preparation by another author. Reviews should be a maximum of 7000 words, including references.

Letters to the editor are considered for publication (subject to editing and abridgment) provided they do not contain material that has been submitted or published elsewhere. The text, not including references, must not exceed 250 words if it is in reference to a recent Journal article, or 400 words in all other cases. A letter must have no more than five references and one figure or table. Letters referring to a recent Journal article must be received within one month of its publication.

Specific Types of Studies

Epidemiological reports

Authors should include the following information in their reports:

Details of study

- Population sampled. National, regional, or specific selected group. Indicate if the sample population is representative of a national or regional population. If neither, state from what population the sample was drawn (e.g. children from an ethnic minority group, children from lower socio-economic status families, children from an urban obesity clinic), giving details and stating why this group may be of significance.
- Time of data collection. Indicate the time period when data were collected (e.g. at school entry autumn 2003, or recruited between January 2002 and July 2002).
- Anthropometric data recorded. Indicate what measures were taken and how (e.g. self reported in interview, reported by parents, measured by school nurse). If measured, indicate whether weight included clothing, shoes etc, height was in shoes or not, waist circumference included clothing, and also indicate definitions of waist, hip, thigh etc). Skinfold measures should also be described carefully.

Defining overweight and obesity

- The prevalence of overweight and obesity should be defined according to cut-off criteria.
- If using national or local definitions, a reference to the source tables giving the cut-off criteria should be provided (cite this in the Reference list as well).
- In addition to any other definitions they elect to apply, authors are required to report prevalence using the IOTF reference for children (Cole, 2000). Reference: Cole TJ, Bellizzi MC, Flegal KM, Dietz WH. Establishing a standard definition for child overweight and obesity worldwide: international survey. *BMJ*. 2000;320:1240-5. Available at <http://bmj.bmjournals.com/cgi/reprint/320/7244/1240>
- In all cases, please state clearly whether or not the figures for 'overweight' include those for 'obese'.

Study results

The presentation of results should include, where appropriate, age- and sex-specific results and an indication of sample size in sub-groups.

Clinical Trials

Trial registration

- All clinical trials published in the Journal must have been prospectively registered in a public trials registry. The details of this policy are contained in the "Uniform Requirements for Manuscripts Submitted to Biomedical Journals" (<http://www.ICMJE.org/>)
- The trial registration number should be given at the end of the Abstract.

Reporting of trials

Trials should be reported in accordance with the CONSORT (Consolidated Standards of Reporting Trials) statement (<http://www.consort-statement.org/>). Please also submit a checklist for editors and reviewers (not for publication) showing that you have covered each of the main CONSORT reporting

points within the text of the manuscript (<http://www.consort-statement.org/Downloads/Checklist.doc>)

Preparation of the Manuscript

MS Word should be used for the text.

Format

- Double-spaced typing, 25mm (1-inch) page margins, preferably on A4 paper (210 x 297 mm)
- Headings, including up to three levels of subheadings, should be used to designate the major sections of the article.
- All pages should be numbered consecutively in the upper right-hand corner.
- The surname of the first author should appear on the upper left-hand corner, followed by a brief running title.

Style

Spelling: Please make spelling consistent with current editions of either Webster's Dictionary or Oxford English Dictionary (note: adrenaline/noradrenaline, isoprenaline are preferred to epinephrine/norepinephrine/isoproterenol).

Units of measurement: All measurements must be given in SI units.

Abbreviations: should be used sparingly and only where they ease the reader's task by reducing repetition of long, technical terms. Initially use the word in full, followed by the abbreviation in parentheses. Thereafter use the abbreviation.

Equations: should be numbered sequentially with Arabic numerals; these should be ranged right in parentheses. All variables should appear in italics. Use the simplest possible form for all mathematical symbols.

Other comments: Upon its first use in the title, abstract and text, the common name of a species should be followed by the scientific name (Genus, species and authority) in parentheses. However, for well-known species, the scientific name may be omitted from the article title. If no common name exists in English, the scientific name should be used only. At the first mention of a chemical substance, give the generic name only. Trade names should not be used. Drugs should be referred to by their generic names, rather than brand names.

Parts of the Manuscript

Manuscripts should be presented in the following order: title page; abstract and keywords; text; acknowledgements; references; figure legends; figures; tables (each table complete with title and footnotes). Footnotes to the text are not allowed and any such material should be incorporated into the text as parenthetical matter.

The **Title page(s)** should contain the following information:

- Title of the paper: short (less than 80 characters, including spaces), informative and contain the major key words.
- A short running head (no more than 50 characters, including spaces)
- Type of manuscript (i.e. Original Article, Short Communication, Review Article)
- Word count and related information:
Separate word counts for abstract and for manuscript (total for text, references, figure legends)

and tables)

Number of References, Tables and Figures

- Full names of the authors
- Addresses of the institutions at which the work was carried out
- Corresponding author information: Full postal and email address, plus facsimile and telephone numbers, of the author to whom correspondence about the manuscript, proofs and requests for offprints should be sent.
- The present address of any author, if different from that where the work was carried out, should be supplied in a footnote
- Conflict of interest statement. This should repeat the information given in the covering letter regarding potential conflicts of interest and funding sources.

Abstract and key words

All *Original Articles* must have a structured abstract that states in 250 words or fewer the purpose, basic procedures, main findings and principal conclusions of the study. Authors are free to choose the most appropriate structure for the abstract but it will usually include the following headings: Objective, Methods, Results, Conclusions.

Short Communications and Review Articles should have an unstructured abstract of 150 words or fewer. The abstract should not contain abbreviations or references.

5-10 key words or phrases (for the purposes of indexing) should be supplied below the abstract, in alphabetical order. These should be taken from those recommended by the US National Library of Medicine's Medical Subject Headings (MeSH) browser list at www.nlm.nih.gov/mesh/meshhome.html.

Text

Authors should use subheadings to divide the sections of their manuscript: Introduction, Methods, Results, Discussion, Acknowledgements, References.

The Introduction should give a short, clear account of the background and reasons for undertaking the study. It should not be a review of the literature. The Introduction should be a maximum of 500 words in length, and ideally shorter.

The Methods must be described in sufficient detail to allow the experiments/data collection to be repeated by others. Common, routine methods need only be described in outline with an appropriate reference to a full description. Manufacturers of equipment and sources of chemicals and drugs must be identified. Calculations and the statistical methods employed must be described in this section. Experiments involving animals or humans must conform to normal ethical standards, and approval by the appropriate Ethics Committee should be stated, if applicable.

Results should not simply repeat data that appear in tables and figures and, likewise, the same data should not be displayed in both tables and figures. The results section should be concise and follow a logical sequence. Do not discuss the results or draw any conclusions in this section.

The Discussion section discusses the significance of the results against the background of existing knowledge, and identify clearly those aspects that are novel. The final paragraph should highlight the main conclusion(s), and provide some indication of the direction future research should take.

Acknowledgements The source of financial grants and other funding should be acknowledged, including a frank declaration of the authors' industrial links and affiliations.

References Identify references in text, tables and legends by Arabic numerals in parentheses. In the reference list, the references should be numbered and listed in order of appearance in the text. Cite the names of all authors when there are six or fewer; when there are seven or more list the first three followed by et al. Names of journals should be abbreviated in the style used in Index Medicus (see examples below). Reference to unpublished data and personal communications should not appear in the list but should be cited in the text only (e.g. A Smith, unpubl. data, 2000).

Journal article 1. Cole TJ, Bellizzi MC, Flegal KM, Dietz WH. Establishing a standard definition for child overweight and obesity worldwide: international survey. *BMJ*. 2000; 320:1240-43.

Book 2. Sallis JF, Owen N. *Physical Activity and Behavioural Medicine*. Thousand Oaks, CA: Sage Publications; 1999.

Chapter in a book 3. Parizkova J, Maffeis C, Poskitt EME. Management through activity. In: Burniat W, Cole TJ, Lissau I, Poskitt EME, editors. *Child and Adolescent Obesity*. Cambridge: Cambridge University Press; 2002. p. 307-26.

Figure legends

Figure legends should be self-explanatory and typed on a separate page titled "Figure Legends". The legend should incorporate definitions of any symbols used and all abbreviations and units of measurement should be explained so that the figure and its legend are understandable without reference to the text.

If a table or figure has been published before, the authors must obtain written permission to reproduce the material in both print and electronic formats from the copyright owner and submit it with the manuscript. This also follows for quotes, illustrations and other materials taken from previously published works not in the public domain. The original source should be cited in the figure caption or table footnote.

Tables

Tables should be self-contained and complement, but not duplicate, information contained in the text. Tables should be numbered consecutively in Arabic numerals (Table 1, Table 2, etc). Each table should be presented on a separate page with a comprehensive but concise legend above the table. Tables should be double-spaced and vertical lines should not be used to separate columns. Column headings should be brief, with units of measurement in parentheses; all abbreviations should be defined in footnotes. The table and its legend/footnotes should be understandable without reference to the text. Authors should ensure that the data in the tables are consistent with those cited in the relevant places in the text, totals add up correctly, and percentages have been calculated correctly. MS Word should be used for tables.

Figures

All illustrations (line drawings and photographs) are classified as figures. Figures should be cited in consecutive order in the text and should be submitted electronically along with the manuscript. Figures should be referred to specifically in the text of the paper but should not be embedded within the text. The use of three-dimensional histograms is strongly discouraged when the addition of the third dimension gives no extra information. PDFs, TIFFs, or EPSs (600 dpi for line art, 300 dpi for halftones and colour) should be used for figures. The full cost of printing figures in colour is borne by the author (USD 200 for the first colour page, and USD 100 per each subsequent page). Colour figures will be

inserted in the online version of the article without charge.

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Appendix 2 – Systematic Review Quality Assessment Pro-Forma

Paper Title:

Authors:

Rationale for the study

A)The study is based on a sound theoretical rationale from which the aims and hypotheses are clearly derived.

Well Covered = 3	The study is based on a clear background justification & theoretical basis including aims/hypotheses
Adequately covered = 2	The study is based on some justification for the rationale although at times this is unclear
Poorly addressed = 1	Rationale for the study is sparse or not adequately provided
Not addressed/not applicable = 0	
Other comments	

Recruitment and sampling:

B) The sample is representative of the overweight/obese child population.

Well Covered = 3	The sample is recruited ensuring minimal sampling bias & is therefore generalizable to the overweight/obese child population
Adequately covered = 2	The sample recruitment introduces an element of bias
Poorly addressed = 1	The sample recruitment is significantly biased therefore reducing the representativeness and subsequent generalizability of results.
Not addressed/not applicable = 0	
Other comments	

C) Recruitment procedures are clear to ensure that any recruitment bias could be considered.

Well Covered = 3	Exact details of recruitment procedures are clear including details of how the study was publicised
Adequately covered = 2	Some details are clear but follow up information could be required for replication
Poorly addressed = 1	Little details is given regarding recruitment procedures resulting in replication being impossible
Not addressed/not applicable = 0	
Other comments	

D) Inclusion/exclusion criteria are clearly defined ensuring that the sample is representative.

Well Covered = 3	Inc/exc are clearly defined giving exact details
Adequately covered = 2	Some details are given but more would be required to replicate study
Poorly addressed = 1	Few details are given
Not addressed/not applicable = 0	
Other comments	

- E) Attrition rates are clear allowing the representativeness of the sample to be considered.

Well Covered = 3	The study gives exact numbers of individuals who dropped out and where possible reasons
Adequately covered = 2	Approximate numbers are given of those dropping out.
Poorly addressed = 1	No details given for drop-out rates.
Not addressed/not applicable = 0	
Other comments	

Measures

- F) Clear criteria have been used to define overweight/obesity which is based on standardised guidelines.

Well Covered = 3	The study measures BMI using a well-defined standardised measure.
Adequately covered = 2	The study measures BMI but it is unclear what method of categorisation they are using.
Poorly addressed = 1	The study does not use a clear measure of BMI
Not addressed/not applicable = 0	
Other comments	

G) The child measure of childhood psychological functioning is psychometrically robust.

Well Covered = 3	Standardised measures used with well reported psychometric properties
Adequately covered = 2	Some standardised measures are used
Poorly addressed = 1	Non- standardised measures used
Not addressed/not applicable = 0	
Other comments	

H) The parent measure of parental psychopathology is psychometrically robust.

Well Covered = 3	Standardised measures used with well reported psychometric properties
Adequately covered = 2	Some standardised measures are used
Poorly addressed = 1	Non- standardised measures used
Not addressed/not applicable = 0	
Other comments	

I) The child questionnaire takes a triangulated approach ensuring the highest quality of information is gathered.

Well Covered = 3	Questionnaire ratings from child, parent and another source
Adequately covered = 2	Rated by two sources
Poorly addressed = 1	Rated by only one source
Not addressed/not applicable = 0	
Other comments	

J) The study includes assessments of mental health/psychological functioning of both parents.

Well Covered = 3	Both parents rated
Adequately covered = 2	Only one parent but clear justification for this
Poorly addressed = 1	Only one parent rated with no justification
Not addressed/not applicable = 0	
Other comments	

Statistical analysis

K) Appropriate statistical tests are used to allow conclusions about the relationships to be drawn

Well Covered = 3	Relationships are addressed using appropriate statistical tests which are correctly reported and interpreted
Adequately covered = 2	Relationships are addressed using some appropriate statistical tests although not always reported or presented correctly
Poorly addressed = 1	Inappropriate tests used or tests made inappropriate by incorrect reporting and interpretation
Not addressed/not applicable = 0	
Other comments	

L) Statistical power of the study is addressed.

Well Covered = 3	Power calculations given and clear details or numbers required and whether study meets power
Adequately covered = 2	Some consideration of power but no calculation given
Poorly addressed = 1	No mention of power
Not addressed/not applicable = 0	
Other comments	

Generalizability

M) Generalizability, limitations and implications are clearly discussed.

Well Covered = 3	The study is an accurate representation of general population & results are therefore generalisable limitations & implications are highlighted and discussed
Adequately covered = 2	The study give some representation although generalisability is limited
Poorly addressed = 1	The sample is unrepresentative & little or no consideration given to these limitations
Not addressed/not applicable = 0	
Other comments	

Appendix 3 – Journal Guidelines for Journal Article

Manuscript Submission Guidelines

Clinical Child Psychology and Psychiatry

1. **Peer review policy**
2. **Article types**
3. **How to submit your manuscript**
4. **Journal contributor's publishing agreement**
 - 4.1 **SAGE Choice and Open Access**
5. **Declaration of conflicting interests policy**
6. **Other conventions**
7. **Acknowledgments**
 - 7.1 **Funding acknowledgement**
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11. **Further information**

Clinical Child Psychology and Psychiatry is a peer reviewed journal that brings together clinically oriented work of the highest distinction from an international and multidisciplinary perspective, offering comprehensive coverage of clinical and treatment issues across the range of treatment modalities.

1. Peer review policy

The Editor will screen manuscripts for their overall fit with the aims and scope of the journal. Those that fit will be further reviewed by two or more independent reviewers. Papers will be evaluated by the Editorial Board and refereed in terms of merit, readability and interest. Unsolicited manuscripts will not be returned to the author.

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2. Article types

Clinical Child Psychology and Psychiatry is interested in advancing theory, practice and clinical research in the realm of child and adolescent psychology and psychiatry and related disciplines. Articles should not usually exceed 7500 words and be clearly organized, with a clear hierarchy of headings and subheadings (3 weights maximum).

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3. How to submit your manuscript

Before submitting your manuscript, please ensure you carefully read and adhere to all the guidelines and instructions to authors provided below. Manuscripts not conforming to these guidelines may be returned.

Clinical Child Psychology and Psychiatry is hosted on SAGE track a web based online submission and peer review system powered by ScholarOne[®] Manuscripts. Please read the Manuscript Submission guidelines below, and then simply visit <http://mc.manuscriptcentral.com/ccpp> to login and submit your article online.

IMPORTANT: Please check whether you already have an account in the system before trying to create a new one. If you have reviewed or authored for the journal in the past year it is likely that you will have had an account created. For further guidance on submitting your manuscript online please visit ScholarOne [Online Help](#).

All papers must be submitted via the online system. If you would like to discuss your paper prior to submission, please refer to the contact details below.

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4. Journal contributor's publishing agreement

Before publication SAGE requires the author as the rights holder to sign a Journal Contributor's Publishing Agreement. For more information please visit our [Frequently Asked Questions](#) on the SAGE Journal Author Gateway.

Clinical Child Psychology and Psychiatry and SAGE take issues of copyright infringement, plagiarism or other breaches of best practice in publication very seriously. We seek to protect the rights of our authors and we always investigate claims of plagiarism or misuse of articles published in the journal. Equally, we seek to protect the reputation of the journal against malpractice. Submitted articles may be checked using duplication-checking software. Where an article is found to have plagiarised other work or included third-party copyright material without permission or with insufficient acknowledgement, or where authorship of the article is contested, we reserve the right to take action including, but not limited to: publishing an erratum or corrigendum (correction); retracting the article (removing it from the journal); taking up the matter with the head of department or dean of the author's institution and/or relevant academic bodies or societies; banning the author from publication in the journal or all SAGE journals, or appropriate legal action.

4.1 SAGE Choice and Open Access

If you or your funder wish your article to be freely available online to non subscribers immediately upon publication (gold open access), you can opt for it to be included in SAGE *Choice*, subject to payment of a publication fee. The manuscript submission and peer review procedure is unchanged. On acceptance of your article, you will be asked to let SAGE know directly if you are choosing SAGE *Choice*. To check journal eligibility and the publication fee, please visit [SAGE Choice](#). For more information on open access options and compliance at SAGE, including self author archiving deposits (green open access) visit [SAGE Publishing Policies](#) on our Journal Author Gateway.

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5. Declaration of conflicting interests

Within your Journal Contributor's Publishing Agreement you will be required to make a certification with respect to a declaration of conflicting interests. **Clinical Child Psychology and Psychiatry** does not require a declaration of conflicting interests but recommends you review the good practice guidelines on the [SAGE Journal Author Gateway](#).

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6. Other conventions

Consent and confidentiality. Disclosure should be kept to a minimum necessary to fulfil the objective of the article. All identifying details should be omitted if they are not essential. The material should be further disguised so that none of the individuals involved could recognise themselves. Some material that is particularly distinctive should be omitted or aggregated. Patient consent to publish should be sought whenever possible, even if the data are anonymized. In case reports where ensuring anonymity is impossible, written consent must be obtained from the clients described, or their legal representative, and submitted with the manuscript. Contributors to the journal should be aware of the risk of complaint by individuals in respect of defamation and breach of confidentiality. If there is concern, then authors should seek legal advice. Authors submitting research reports should confirm that approval from the appropriate ethical committee has been granted.

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7. Acknowledgements

Any acknowledgements should appear first at the end of your article prior to your Declaration of Conflicting Interests (if applicable), any notes and your References.

All contributors who do not meet the criteria for authorship should be listed in an 'Acknowledgements' section. Examples of those who might be acknowledged include a person who provided purely technical help, writing assistance, or a department chair who provided only general support. Authors should disclose whether they had any writing assistance and identify the entity that paid for this assistance.

7.1 Funding Acknowledgement

To comply with the guidance for Research Funders, Authors and Publishers issued by the Research Information Network (RIN), **Clinical Child Psychology and Psychiatry** additionally requires all Authors to acknowledge their funding in a consistent fashion under a separate heading. Please visit our [Funding Acknowledgement](#) on the SAGE Journal Author Gateway for funding acknowledgement guidelines.

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8. Permissions

Authors are responsible for obtaining permission from copyright holders for reproducing any illustrations, tables, figures or lengthy quotations previously published elsewhere. For further information including guidance on fair dealing for criticism and review, please visit our [Frequently Asked Questions](#) on the SAGE Journal Author Gateway.

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9. Manuscript style

9.1 File types .

Only electronic files conforming to the journal's guidelines will be accepted. Word DOC is the

preferred format for the text and tables of your manuscript. Please also refer to additional guideline on submitting artwork [and supplemental files] below.

9.2 Journal Style

Clinical Child Psychology and Psychiatry conforms to the SAGE house style. [Click here](#) to review guidelines on SAGE UK House Style

9.3 Reference Style

Clinical Child Psychology and Psychiatry adheres to the APA reference style. [Click here](#) to review the guidelines on APA to ensure your manuscript conforms to this reference style.

9.4. Manuscript Preparation

The text should be double-spaced throughout and with a minimum of 3cm for left and right hand margins and 5cm at head and foot. Text should be standard 10 or 12 point.

9.4.1 Your Title, Keywords and Abstracts: Helping readers find your article online

The title, keywords and abstract are key to ensuring readers find your article online through online search engines such as Google. Please refer to the information and guidance on how best to title your article, write your abstract and select your keywords by visiting SAGE's Journal Author Gateway Guidelines on [How to Help Readers Find Your Article Online](#).

9.4.2 Corresponding Author Contact details

Provide full contact details for the corresponding author including email, mailing address and telephone numbers. Academic affiliations are required for all co-authors. These details should be presented separately to the main text of the article to facilitate anonymous peer review.

9.4.3 Guidelines for submitting artwork, figures and other graphics

For guidance on the preparation of illustrations, pictures and graphs in electronic format, please visit SAGE's [Manuscript Submission Guidelines](#).

Figures supplied in colour will appear in colour online regardless of whether or not these illustrations are reproduced in colour in the printed version. For specifically requested colour reproduction in print, you will receive information regarding the costs from SAGE after receipt of your accepted article.

Figures, tables, etc.: should be numbered consecutively, carry descriptive captions and be clearly cited in the text. Keep them separate from the text itself, but indicate an approximate location on the relevant text page. Line diagrams should be presented as camera-ready copy on glossy paper (b/w, unless to be reproduced - by arrangement - in colour) and, if possible, on disk as EPS files (all fonts embedded) or TIFF files, 800 dpi - b/w only. For scanning, photographs should preferably be submitted as clear, glossy, unmounted b/w prints with a good range of contrast or on disk as TIFF files, 300 dpi.

9.4.4 Guidelines for submitting supplemental files

Clinical Child Psychology and Psychiatry does not currently accept supplemental files.

9.4.5 English Language Editing services

Non-English speaking authors who would like to refine their use of language in their manuscripts might consider using a professional editing service. Visit [English Language Editing Services](#) for further information.

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10. After acceptance

10.1 Proofs

We will email a PDF of the proofs to the corresponding author.

10.2 E-Prints

SAGE provides authors with access to a PDF of their final article. For further information please visit <http://www.sagepub.co.uk/authors/journal/reprint.sp>.

10.3 SAGE Production

At SAGE we place an extremely strong emphasis on the highest production standards possible. We attach high importance to our quality service levels in copy-editing, typesetting, printing, and online publication (<http://online.sagepub.com/>). We also seek to uphold excellent author relations throughout the publication process.

We value your feedback to ensure we continue to improve our author service levels. On publication all corresponding authors will receive a brief survey questionnaire on your experience of publishing in **Clinical Child Psychology and Psychiatry** with SAGE.

10.4 OnlineFirst Publication

A large number of SAGE journals benefit from OnlineFirst, a feature offered through SAGE's electronic journal platform, SAGE Journals Online. It allows final revision articles (completed articles in queue for assignment to an upcoming issue) to be hosted online prior to their inclusion in a final print and online journal issue which significantly reduces the lead time between submission and publication. For more information please visit our [OnlineFirst Fact Sheet](#)

11. Further information

Any correspondence, queries or additional requests for information on the Manuscript Submission process should be sent to the Editorial Office as follows:

Prof. Rudi Dallos (r.dallos@plymouth.ac.uk) and **Prof. Arlene Vetere** (drarlenevetere@hotmail.com).

North America: Prof. John Leventhal, Yale University, Section of Paediatrics, School of Medicine, 333 Cedar Street, PO Box 208064, New Haven, Connecticut. Tel: 001 203 688 2468 Fax: 001 203 785 3932. **Email: John.Leventhal@Yale.Edu**

Books for review should be sent to: Ramon Karamat Ali,

C/O Child & Adolescent Mental
Health Service (CAMHS)
Torbay Care Trust
Torbay Hospital Annexe
187 Newton Road
Torquay, TQ2 7BA, UK
Email: r.karamatali@nhs.net

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Appendix 4 – Permission Letters from Directors of Education for the areas



Director: Neil Logue

Angus House

Orchardbank Business Park

Forfar

DD8 1AE

EMAIL

NL/AM

21 June 2011

Professor Kevin Power
Area Head of Service
Tayside Area Psychological Therapies Service
7 Dudhope Terrace
DUNDEE
DD3 6HG

Dear Professor Power

PROPOSED RESEARCH: CLARE HAMILTON, TRAINEE CLINICAL PSYCHOLOGIST

Thank you for your email and helpful enclosures of 20 June 2011.

I would be pleased to support Ms Hamilton's proposed research project. Ms Hamilton should now feel free to contact the Head Teachers of the Angus primary schools which have agreed to participate in the POST healthy eating programme.

Please note that, in accordance with standard authority procedures, the involvement of a school in a research project is properly a matter for the judgement of individual Head Teachers.

I trust the above advice is of assistance.

Yours sincerely

A handwritten signature in black ink, appearing to read 'Neil Logue'. The signature is fluid and cursive, with the first name 'Neil' and the last name 'Logue' clearly distinguishable.

Neil Logue
Director of Education

cc Clare Hamilton, Trainee Clinical Psychologist

**Delayed Office Opening for
Employee Training**

*This Office will be closed from 8.45 am
– 11.00 am on the 1st Thursday of each
month.*



Clare Hamilton
Trainee Clinical Psychologist
Centre for Child Health
19 Dudhope Terrace
Dundee
DD3 6HH

Pullar House 35 Kinnoull Street
Perth PH1 5GD
Tel (01738) 476200/476211
Fax (01738) 476210

Contact Tracy Hutchison
Direct Dial (01738) 476349
Email: THutchison@pkc.gov.uk
Website: www.pkc.gov.uk

Our ref JG/TH

Your ref

Date 29 September 2011

Dear Ms Hamilton

Paediatric Overweight Service, Tayside (POST)

Thank you for your request to undertake research in Perth and Kinross.

I am pleased to confirm that your research has been approved in principle by Education and Children's Services Senior Management, subject to the conditions enclosed.

The final decision to permit the research in their establishment lies with the Headteacher/Head of Establishment and you will be required to provide an original copy of this approval letter.

We look forward to receiving a copy of the findings of your research.

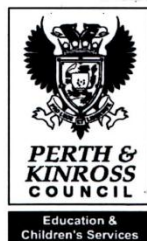
Yours sincerely

Joanna Gilchrist,
Team Leader – Performance and Scrutiny

Enc

Copy to: Sheena Devlin, Head of Education (Early Years & Primary)

John Fyfe
Executive Director



Where approval in principle has been granted by Education and Children's Service Senior Management, the final decision to permit the research in their establishment lies with the Headteacher/Head of Establishment. The Headteacher/Head of Establishment will be responsible for ensuring, where relevant, the following conditions are met. Headteachers may also require to consult with the Parent Council if the project specifically relates to an area where they have a statutory function.

Conditions of Approval

1. There will be no unsupervised contact with children/young people or access to confidential information held by Perth and Kinross Council.
2. Researchers must obtain appropriate parental/carer permissions where required. The requirement for parental/carer permission must be agreed with, and facilitated by, the Headteachers/Heads of Establishment prior to the research starting.
3. Strict observation of confidentiality must be respected and in particular the researcher must comply with the terms of the Data Protection Act. The researcher must be able to satisfy the Council that all research will be carried out in a manner which complies with both the Data Protection Act and any ethical research standards relevant to the research being carried out.
4. The methodology involved in conducting the research does not in any way impair the educational process or health and wellbeing of children/young people.
5. The involvement of all Council staff with research projects is understood to be entirely voluntary.
6. All relevant details of the research project are disclosed on the attached application form.
7. No disclosure of the findings of the research project is to take place before a date specified at the outset of the project, unless with the specific permission of the Executive Director, Education and Children's Services.
8. A copy of the findings of the research project should be sent to the Performance and Scrutiny Team, free of charge, on completion of the project.

Appendix 5 – Correspondence from Research & Development

2011PZ09 - R&D Registration of Study "Obesity and it effects"

Hogg Lindsay (NHS TAYSIDE)

You forwarded this message on 28/03/2012 14:49.

Sent: 25 October 2011 12:38

To: hamilton clare (NHS TAYSIDE)

Dear Clare,

Tayside R&D Project ID: 2011PZ09

Title: Factors affecting quality of life in children with differing Body Mass Index.

Main REC Ref: 11/ES/0035

The R&D Office in NHS Tayside recently received notification of the above study. This e-mail confirms the study has been registered on our database for awareness; however, we do not feel management approval is required from NHS Tayside. Even though you are an employee of NHS Tayside you are undertaking this study as part of your Doctorate in Clinical Psychology with the University of Edinburgh. Despite some participants being recruited via POST (an NHS Tayside service) the R&D Office do not feel these are patients.

If there is any other involvement from NHS Tayside which you feel requires management approval please do not hesitate to bring this to my attention and the proposal will be reconsidered.

Kind Regards

Lindsay

Lindsay Hogg

Senior Non-Commercial Research & Development Administrator

Tayside medical Science Centre (TASC)

Research & Development Office

Ninewells Hospital & Medical School

Residency Block, Level 3

George Pirie Way

Dundee

DD1 9SY

Appendix 6 – Ethical Approval Correspondence

EoSRES



East of Scotland Research Ethics Service (EoSRES) REC 2

(formerly Fife & Forth Valley REC)
Tayside Medical Sciences Centre (TASC)
Residency Block C, Level 3
Ninewells Hospital & Medical School
George Pirie Way
Dundee DD19SY

Miss Clare Hamilton
Trainee Clinical Psychologist
NHS Tayside
Centre for Child Health
19 Dudhope Terrace
DUNDEE
DD3 6HH

Date: 11 January 2012
Your Ref:
Our Ref: FB/11/ES/0035
Enquiries to: Miss Fiona Bain
Extension: Ninewells extension: 32701
Direct Line: 01382 632701
Email: fionabain@nhs.net

Dear Miss Hamilton

Study title: Factors affecting quality of life in children with differing Body Mass Index.
REC reference: 11/ES/0035

Thank you for your recent letter, responding to the Committee's request for further information on the above research and submitting revised documentation.

The further information was considered by a sub-committee of the REC at a meeting held on 10 January 2012. A list of the sub-committee members is attached.

Confirmation of ethical opinion

On behalf of the Committee, I am pleased to confirm a favourable ethical opinion for the above research on the basis described in the application form, protocol and supporting documentation as revised, subject to the conditions specified below.

Ethical review of research sites

Non-NHS sites

Conditions of the favourable opinion

The favourable opinion is subject to the following conditions being met prior to the start of the study.

Management permission or approval must be obtained from each host organisation prior to the start of the study at the site concerned.

Management permission ("R&D approval") should be sought from all NHS organisations involved in the study in accordance with NHS research governance arrangements.

Guidance on applying for NHS permission for research is available in the Integrated Research Application System or at <http://www.rdforum.nhs.uk>.



Where a NHS organisation's role in the study is limited to identifying and referring potential participants to research sites ("participant identification centre"), guidance should be sought from the R&D office on the information it requires to give permission for this activity.

For non-NHS sites, site management permission should be obtained in accordance with the procedures of the relevant host organisation.

Sponsors are not required to notify the Committee of approvals from host organisations

It is the responsibility of the sponsor to ensure that all the conditions are complied with before the start of the study or its initiation at a particular site (as applicable).

Approved documents

The final list of documents reviewed and approved by the Committee is as follows:

Document	Version	Date
Covering Letter		
Evidence of insurance or indemnity	ACCORD letter	11 October 2011
Investigator CV	Clare Hamilton	10 October 2011
Investigator CV	Laura Stewart	
Investigator CV	Paul Morris	
Investigator CV	Kevin Power - Resume 2011 KP/LS	
Letter of invitation to participant	School - Parent/Guardian - 2	10 December 2011
Letter of invitation to participant	POST - Parent Information - 2	10 December 2011
Letter of invitation to participant	2	10 December 2011
Letter of invitation to participant	2	10 December 2011
Other: Letter to Head Teacher	1	01 October 2011
Other: Non-NHS SSI	85755/255908/7/903/130229/ 225108	06 October 2011
Other: Acknowledgement letter from Dundee City Council		05 October 2011
Other: Non-NHS SSI	85755/255904/7/256/130228/ 225105	06 October 2011
Other: Letter of approval from Perth & Kinross Council		29 September 2011
Other: Non-NHS SSI	85755/255935/7/930/129453/ 224115	06 October 2011
Other: Email letter support of project from Angus Council		21 June 2011
Participant Consent Form		
Participant Consent Form: POST - Parent/Guardian Consent Form	2	10 December 2011
Participant Consent Form: School - Parent/Guardian Consent Form	2	10 December 2011
Participant Consent Form	2	10 December 2011
Participant Consent Form	2	10 December 2011
Participant Information Sheet: Schools (includes consent form)	2	10 December 2011
Participant Information Sheet: Post (includes consent form)	2	10 December 2011

Document	Version	Date
Participant Information Sheet: School - Parent/Guardian Information Sheet	2	10 December 2011
Participant Information Sheet: POST - Parent/Guardian Information Sheet	2	10 December 2011
Participant Information Sheet	2	10 December 2011
Participant Information Sheet	2	10 December 2011
Participant Information Sheet	2	10 December 2011
Participant Information Sheet	2	10 December 2011
Protocol	1	01 October 2011
Questionnaire: Paediatric Quality of Life Inventory (PedsQL)	4.0	
Questionnaire: The Self Image Profile for Children (SIP-C)		
Questionnaire: Resiliency Scales for children & adolescents booklet		
Questionnaire: Information about you	1	01 October 2011
REC application	85755/255874/1/658	06 October 2011
Response to Request for Further Information		
Response to Request for Further Information		

Statement of compliance

The Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees (July 2001) and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.

After ethical review

Reporting requirements

The attached document "*After ethical review – guidance for researchers*" gives detailed guidance on reporting requirements for studies with a favourable opinion, including:

- Notifying substantial amendments
- Adding new sites and investigators
- Notification of serious breaches of the protocol
- Progress and safety reports
- Notifying the end of the study

The NRES website also provides guidance on these topics, which is updated in the light of changes in reporting requirements or procedures.

Feedback

You are invited to give your view of the service that you have received from the National Research Ethics Service and the application procedure. If you wish to make your views known please use the feedback form available on the website.

Further information is available at National Research Ethics Service website > After Review



11/ES/0035

Please quote this number on all correspondence

Yours sincerely



for **Mr Gavin Costa**
Chair

Email: fionabain@nhs.net

Enclosures: List of names and professions of members who were present at the meeting
and those who submitted written comments

"After ethical review – guidance for researchers"

Copy to: Lynn Morrice, University of Edinburgh
Mrs Elizabeth Coote, NHS Tayside



EoSRES**East of Scotland Research Ethics Service (EoSRES) REC 2**

(formerly Fife & Forth Valley REC)
 Tayside Medical Sciences Centre (TASC)
 Residency Block C, Level 3
 Ninewells Hospital & Medical School
 George Pirie Way
 Dundee DD19SY

Miss Clare Hamilton
 Trainee Clinical Psychologist
 NHS Tayside
 Centre for Child Health
 19 Dudhope Terrace
 DUNDEE
 DD3 6HH

Date: 08 February 2012
 Your Ref:
 Our Ref: FB/11/ES/0035
 Enquiries to: Miss Fiona Bain
 Extension: Ninewells extension: 32701
 Direct Line: 01382 632701
 Email: fionabain@nhs.net

Dear Miss Hamilton

Study title: Factors affecting quality of life in children with differing Body Mass Index.
REC reference: 11/ES/0035
Amendment number: AM01
Amendment date: 31 January 2012

The above amendment was reviewed at the meeting of the Sub-Committee held on 07 February 2012 in correspondence.

Ethical opinion

Please note that the Letters of Invitation; Participant Information Sheets and Consent Forms should be version 4. You had previously submitted version 3 of these document dated 15 January 2012 in response to a typographical error comment. Can you please amend the version number and submit for our records?

The members of the Committee taking part in the review gave a favourable ethical opinion of the amendment on the basis described in the notice of amendment form and supporting documentation.

Approved documents

The documents reviewed and approved at the meeting were:

Document	Version	Date
Copy of email from sponsor		26 January 2012
Invitation to Schools	2	25 January 2012
Letter of invitation to participant	School Version 3	25 January 2012
Participant Consent Form: Post	3	25 January 2012
Participant Consent Form: School	3	25 January 2012
Participant Information Sheet: Post	3	25 January 2012
Participant Information Sheet: School	3	25 January 2012



Document	Version	Date
Protocol	2	25 January 2012
Notice of Substantial Amendment (non-CTIMPs)	AM01	31 January 2012
Covering Letter		
Letter of invitation to participant	Post Version 3	25 January 2012

Membership of the Committee

The members of the Committee who took part in the review are listed on the attached sheet.

R&D approval

All investigators and research collaborators in the NHS should notify the R&D office for the relevant NHS care organisation of this amendment and check whether it affects R&D approval of the research.

Statement of compliance

The Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.

11/ES/0035:

Please quote this number on all correspondence

Yours sincerely



Mr Gavin Costa
Chair

E-mail: fionabain@nhs.net

Enclosures: List of names and professions of members who took part in the review

Copy to: Mrs Elizabeth Coote, NHS Tayside
Lynn Morrice, University of Edinburgh

EoSRES**East of Scotland Research Ethics Service (EoSRES) REC 2**

(formerly Fife & Forth Valley REC)
 Tayside Medical Sciences Centre (TASC)
 Residency Block C, Level 3
 Ninewells Hospital & Medical School
 George Pirie Way
 Dundee DD19SY

Miss Clare Hamilton
 Trainee Clinical Psychologist
 Centre for Child Health
 19 Dudhope Terrace
 DUNDEE
 DD3 6HH

Date: 05 September 2012
 Your Ref:
 Our Ref: LR/11/ES/0035
 Enquiries to: Mrs Lorraine Reilly
 Extension: Ninewells extension: 7783878
 Direct Line: 01382 383878
 Email: Lorraine.reilly@nhs.net

Dear Miss Hamilton

Study title: Factors affecting quality of life in children with differing Body Mass Index.
REC reference: 11/ES/0035
Amendment number: AM02
Amendment date: 28 August 2012

The above amendment was reviewed at the meeting of the Sub-Committee held on 04 September 2012.

Ethical opinion

There were no ethical issues noted.

The members of the Committee taking part in the review gave a favourable ethical opinion of the amendment on the basis described in the notice of amendment form and supporting documentation.

Approved documents

The documents reviewed and approved at the meeting were:

Document	Version	Date
Copy of Email from Sponsor		28 August 2012
Email		29 August 2012
Protocol	3	23 August 2012
Notice of Substantial Amendment (non-CTIMPs)	AM02	28 August 2012
Covering Letter		

Membership of the Committee

The members of the Committee who took part in the review are listed on the attached sheet.



R&D approval

All investigators and research collaborators in the NHS should notify the R&D office for the relevant NHS care organisation of this amendment and check whether it affects R&D approval of the research.

Statement of compliance

The Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.

11/ES/0035:	Please quote this number on all correspondence
--------------------	---

Yours sincerely


 **Dr Fergus Daly**
Chair

E-mail: eosres.tayside@nhs.net

Enclosures: List of names and professions of members who took part in the review

Copy to: NHS Tayside R&D Office
 Lynn Morrice, University of Edinburgh

Appendix 7 – School Invite



Clare Hamilton
Trainee Clinical Psychologist
Centre for Child Health
19 Dudhope Terrace
Dundee
DD3 6HH

Tel: 01382 346565
Clare.hamilton@nhs.net

Primary School name
Address

Dear Headteacher

I write to seek your approval for a proposed research project within primary 5, 6 and 7 of your primary school. Your Director of Education has already been contacted and has agreed for me to contact you to ask for your consideration to become involved in my research

Childhood obesity is recognised as a growing problem in the UK with the development of government targets aimed at dealing with the problem (HEAT 3). This has led to the development of health board initiatives such as the Paediatric Overweight Service Tayside (POST), who have been set up in an attempt to deal with this growing epidemic. As yet however, we do not fully understand the best way to manage or treat this problem. As part of my Doctoral training in Clinical Psychology (through NHS Tayside and the University of Edinburgh), in conjunction with the POST service and with your permission, and that of local primary schools, I am hoping to undertake some research into the area of obesity and quality of life to broaden our understanding of this area. The study is sponsored by the University of Edinburgh, who provide support in compliance with the research governance framework. A favourable ethical opinion has been sought from the NHS Tayside Research Ethics Committee and the study has also been reviewed by an internal ethics committee at the University of Edinburgh

As you have agreed to take part in the POST “funfittayside” programme I am inviting you to take part in the current research. The study aims to examine relationships between Body Mass Index, Self Esteem, Resilience and Quality of Life in P5/6/7 children (120 approximately). For the sake of analysis the children will be categorised into three groups

according to their BMI, obese children whose data will be collected primarily through the POST service, overweight children and normal weight children where the latter groups will be collected through the schools. These groupings and the BMI's will not be discussed with the children. In line with Governmental Health targets the POST service will be taking the height and weight of each child in order to determine their BMI. This data will be accessed by this project and matched to the children's questionnaires.

Data will be collected through four brief self-report questionnaires, The Paediatric Quality of Life Scale, PedsQL, The Resiliency Scale for Children and Adolescents, The Self Image Profile For Children which is rated twice, once how the child sees themselves at present giving them a Self Image score and once for how they would like to be giving them a Self Esteem score.

If your schools chooses to take part in the study, information leaflets and informed consent forms will be given to children to take home to their parent/guardian (in line with current protocol, see attached example). Teachers will be asked to identify children who meet the exclusion criteria (e.g. learning disability, health problems, diabetes). Data collection is likely to take in the region of thirty minutes and is envisaged to take place in session 8 of POST's "funfittayside" programme. Alternatively it can be done at a time to suit the school. Child information sheets will be given to children who have been given consent to take part (see attached example).

It is hoped that the research will increase understanding of the different factors that determine and influence quality of life in order that these may be addressed in any future intervention, especially those targeted at obese children. The study results will be disseminated to participating schools via a brief summary report. The intention would also be for the results to be published in a peer reviewed journal.

I would be grateful if you could advise whether your school would agree to taking part in the study. I am happy to meet with you if you feel this would be beneficial. If you have any questions or require any further information please do not hesitate to contact me.

Yours sincerely

Clare Hamilton
Trainee Clinical Psychologist



Appendix 8 – Parent Invite, Clinic



Clare Hamilton
 Trainee Clinical Psychologist
 Centre for Child Health
 19 Dudhope Terrace
 Dundee
 DD3 6HH
 Tel: 01382 346565

Dear Parent/Guardian

Your child is invited to take part in a research study, which aims to look at factors which influence quality of life in children with different BMI's. The study is for children in primary 5, 6 and 7 who are receiving input from the POST service. The study is being completed as part of the researcher's Doctorate in Clinical Psychology, is sponsored by the University of Edinburgh and has been granted favourable ethical opinion by the East of Scotland Research Ethics Service (EoSRES) REC 2 and the University of Edinburgh ethics committee. The research has also sought permission from the Director of Education for your area and your child's Primary School.

A copy of the 'Parent/Guardian information Sheet' has been attached, but should you have any further questions please do not hesitate to contact Clare Hamilton (Primary Researcher) on 01382 346565. A copy of the 'Child Information Sheet' has also been attached. This would be given to your child prior to the study if you consent to them taking part.

If you consent to your child taking part in the study, please sign and return the attached Consent Form to the principal researcher, Clare Hamilton, in the addressed envelope provided.

Thank you very much for your time

Kind regards

Clare Hamilton



PARENT/GUARDIAN INFORMATION SHEET

Factors affecting Quality of life in children with differing Body Mass Index.

My name is Clare Hamilton and I am a student of Edinburgh University, and an employee of NHS Tayside. I am undertaking a project as part of my Clinical Psychology Doctorate and would like to invite you to consent to your child taking part in the following study. Before you decide to do so, I need to be sure that you understand firstly why I am doing this, and what it would involve for your child if you agreed to take part. I am therefore providing you with the following information. Please read the following carefully and be sure to contact myself or my supervisors (details at the end) with any questions you might have.

BACKGROUND TO THE PROJECT

This is a joint project between University of Edinburgh and NHS Tayside.

What is the project about?

Previous research has found that increased weight in a child can lead to a reduced quality of life and can also negatively affect children's self-esteem and self image. However this is not always the case as other factors such as resilience can sometimes protect against this. It is therefore important to gain a better understanding of the effects of weight on quality of life and what role other factors may play. This will help to inform future treatment options and further our understanding in this area.

Why is my child being asked to take part in this study?

Your child is being asked to take part in the study because they are in primary 5, 6 or 7 of and are receiving input from the Paediatric Overweight Service (POST). It is important to gain information from children of all different weights to take part in the study.

Will taking part be of benefit to my child, or others in the future?

If you consent to your child taking part in the study, you will be helping us to understand more about what psychological factors influencing quality of life in children of differing weights. It is hoped that this will help to improve services and treatments for children with weight difficulties in the future.

If you would like to receive feedback about the overall results of the study, then please indicate this on the consent form, and feedback will be sent to you on completion of the study.

WHAT DOES THE PROJECT INVOLVE?

What will my child be asked to do?

Your child's height and weight will be taken as part of the POST intervention they are receiving. With your permission these details will be accessed to calculate your child's BMI – *this will not be shared with your child*. BMI or Body Mass Index is a calculation which uses height and weight to determine whether a person is of a healthy weight. Your child will be asked some general questions about their activity levels and hobbies. Your child will then be asked to complete four questionnaires. The first asks them for some information about their quality of life. They will then complete a questionnaire about their resilience. The final questionnaire is completed twice, once recording their self-concept and how they see themselves at present and again as to how they would like to be. The questionnaires will then be placed in an envelope and collected by me. Every child agreeing to take part in the study will be completing the same questionnaires and giving the same information.

How long will it take my child?

The study should take each child approximately 30 minutes during a POST session.

Are there any discomforts or risks to my child?

There are not thought to be any risks to your child from taking part in the study. The questionnaires are routinely used in both clinical practice and research and have not been shown to cause any upset or distress. If your child experiences any distress the researcher and the school nurse will be available to offer advice.

If your child discloses any information during the study which indicates a cause for concern local child protection guidelines will be followed.

What will happen to the information you collect from my child?

All information will be treated with the strictest confidence. With your permission, we will inform your child's GP of his/her participation in the study. Once questionnaires are completed they will be matched with height and weight information. All names will then be removed and the information will then be marked with a distinct code to ensure it is anonymous. No personal details will be stored. The data will be stored on a password protected computer, in a secure NHS building. Only the Chief Investigator and her supervisors will have access to the data. Following completion of the study, that anonymous data will be stored for 3 years and then will be destroyed.

WHAT ARE MY RIGHTS?

Do I have to allow my child to take part?

You are free to choose for your child not to take part in the study by not completing the consent form. If you choose to consent you are free to decide to withdraw consent at any point by either contacting the school or the researcher at the number below. Your child also has the right to withdraw from the study at any point without having to provide any explanation. Your decision for your child to take part or not will have no effect at all on the treatment your child receives now or in the future from the NHS, nor will it affect your relationship with the school.

If you have a concern about any aspect of this study, you should ask to speak to the researchers who will do their best to answer your questions. Contact details can be found below. If you remain unhappy and wish to complain formally, you can do this through the NHS Complaints Procedure. Details can be obtained from Ninewells Hospital and Medical School. The East of Scotland Research Ethics Service (EoSRES) REC 2, which has responsibility for scrutinising proposals for medical research on humans, has examined the proposal and has raised no objections from the point of view of medical ethics. It is a requirement that your child's records in this research, together with any relevant medical records, be made available for scrutiny by monitors from the University of Edinburgh and NHS Tayside, whose role is to check that research is properly conducted and the interests of those taking part are adequately protected.

Thank you for taking the time to read this Information Sheet and for consideration of your child taking part in this study.

Principal Researcher

Clare Hamilton
Trainee Clinical Psychologist
Centre for Child Health
19 Dudhope Terrace
Dundee
DD3 6HH

Tel: 01382 346565

NHS Complaints

Patient Liaison Manager,
Complaints Office
Ninewells Hospital
Dundee
DD1 9SY
Tel: 0800 027 5507

CONSENT FORM**Factors affecting Quality of life in children with differing Body Mass Index.****Please initial in the box provide**

I have read and understood the Parent Information Sheet

I confirm that I have received enough information about this study

If no, did you contact the research team and were your questions answered to your satisfaction

Do you understand that your child's participation is entirely voluntary

Do you understand that you child is free to withdraw from the study:

At any time

Without giving a reason

Without affecting his/her present or future care

Do you agree to your child taking part in this study

Name of person taking consent.....

Date.....

I am the parent/guardian of.....

...DOB.....

Primary School..... Home postcode.....
(optional)

Do you wish to be kept informed regarding the results of the study? Y / N

If 'yes', please enter your details below:

If you agree to your child's GP being contacted please enter the details below.

Name.....

GP Name.....

Address.....

GP Address.....

.....

.....

Post Code.....

.....

Thank you for agreeing for your child to take part in this study. Your child's answers are confidential, and all data will be anonymised.

Appendix 9 – Parent Invite, School

Clare Hamilton
Trainee Clinical Psychologist
Centre for Child Health
19 Dudhope Terrace
Dundee
DD3 6HH
Tel: 01382 346565

Dear Parent/Guardian

Your child is invited to take part in a research study, which aims to look at factors which influence quality of life in children with different BMI's. The study is for children in primary 5, 6 or 7 in a number of primary schools across Tayside. The study is being completed as part of the researcher's Doctorate in Clinical Psychology, is sponsored by the University of Edinburgh and has been granted favourable ethical opinion by the NHS Tayside Research Ethics Committee and the University of Edinburgh ethics committee. The research has also sought permission from the Director of Education for you area and your child's Primary School.

A copy of the 'Parent/Guardian information Sheet' has been attached, but should you have any further questions please do not hesitate to contact Clare Hamilton (Primary Researcher) on 01382 346565. A copy of the 'Child Information Sheet' has also been attached. This would be given to your child prior to the study if you consent to them taking part.

If you consent to your child taking part in the study, please sign and return the attached Consent Form to the principal researcher, Clare Hamilton, in the stamped addressed envelope provided.

Thank you very much for your time

Kind regards

Clare Hamilton



PARENT/GUARDIAN INFORMATION SHEET

Factors affecting Quality of life in children with differing Body Mass Index.

My name is Clare Hamilton and I am a student of Edinburgh University, and an employee of NHS Tayside. I am undertaking a project as part of my Clinical Psychology Doctorate and would like to invite you to consent to your child taking part in the following study. Before you decide to do so, I need to be sure that you understand firstly why I am doing this, and what it would involve for your child if you agreed to take part. I am therefore providing you with the following information. Please read the following carefully and be sure to contact myself or my supervisors (details at the end) with any questions you might have.

BACKGROUND TO THE PROJECT

This is a joint project between University of Edinburgh and NHS Tayside.

What is the project about?

Previous research has found that increased weight in a child can lead to a reduced quality of life and can also negatively affect children's self-esteem and self image. However this is not always the case as other factors such as resilience can sometimes protect against this. It is therefore important to gain a better understanding of the effects of weight on quality of life and what role other factors may play. This will help to inform future treatment options and further our understanding in this area.

Why is my child being asked to take part in this study?

Your child is being asked to take part in the study because they are in primary 5, 6 or 7 of one of the primary schools within Tayside who have agreed to take part in the study and who are receiving input from the Paediatric Overweight Service (POST). It is important to gain information from children of all different weights to take part in the study.

Will taking part be of benefit to my child, or others in the future?

If you consent to your child taking part in the study, you will be helping us to understand more about what psychological factors influencing quality of life in children of differing weights. It is hoped that this will help to improve services and treatments for children with weight difficulties in the future.

If you would like to receive feedback about the overall results of the study, then please indicate this on the consent form, and feedback will be sent to you on completion of the study.

WHAT DOES THE PROJECT INVOLVE?

What will my child be asked to do?

Your child's height and weight will be taken as part of the POST service "funfittayside" programme, currently happening in their school. With your permission these details will be accessed to calculate your child's BMI – *this will not be shared with your child*. BMI or Body Mass Index is a calculation which uses height and weight to determine whether a person is of a healthy weight. Your child will be asked some general questions about their activity levels and hobbies. Your child will then be asked to complete four questionnaires. The first asks them for some information about their quality of life. They will then complete a questionnaire about their resilience. The final questionnaire is completed twice, once recording their self-concept and how they see themselves at present and again as to how they would like to be. The questionnaires will then be placed in an envelope and collected by me. Every child agreeing to take part in the study will be completing the same questionnaires and giving the same information.

How long will it take my child?

The study should take each child approximately 30 minutes during school time identified and agreed by the teacher.

Are there any discomforts or risks to my child?

There are not thought to be any risks to your child from taking part in the study. The questionnaires are routinely used in both clinical practice and research and have not been shown to cause any upset or distress. If your child experiences any distress the researcher and the school nurse will be available to offer advice.

If your child discloses any information during the study which indicates a cause for concern local child protection guidelines will be followed.

What will happen to the information you collect from my child?

All information will be treated with the strictest confidence. With your permission, we will inform your child's GP of his/her participation in the study. Once questionnaires are completed they will be matched with height and weight information. All names will then be removed and the information will then be marked with a distinct code to ensure it is anonymous. No personal details will be stored. The data will be stored on a password protected computer, in a secure NHS building. Only the Chief Investigator and her supervisors will have access to the data. Following completion of the study, that anonymous data will be stored for 3 years and then will be destroyed.

WHAT ARE MY RIGHTS?

Do I have to allow my child to take part?

You are free to choose for your child not to take part in the study by not completing the consent form. If you choose to consent you are free to decide to withdraw consent at any point by either contacting the school or the researcher at the number below. Your child also has the right to withdraw from the study at any point without having to provide any explanation. Your decision for your child to take part or not will have no effect at all on the treatment your child receives now or in the future from the NHS, nor will it affect your relationship with the school.

If you have a concern about any aspect of this study, you should ask to speak to the researchers who will do their best to answer your questions. Contact details can be found below. If you remain unhappy and wish to complain formally, you can do this through the NHS Complaints Procedure. Details can be obtained from Ninewells Hospital and Medical School. The East of Scotland Research Ethics Service (EoSRES) REC 1, which has responsibility for scrutinising proposals for medical research on humans in Tayside, has examined the proposal and has raised no objections from the point of view of medical ethics. It is a requirement that your child's records in this research, together with any relevant medical records, be made available for scrutiny by monitors from the University of Edinburgh and NHS Tayside, whose role is to check that research is properly conducted and the interests of those taking part are adequately protected.

Thank you for taking the time to read this Information Sheet and for consideration of your child taking part in this study.

Principal Researcher

Clare Hamilton
Trainee Clinical Psychologist
Centre for Child Health
19 Dudhope Terrace
Dundee
DD3 6HH

Tel: 01382 346565

NHS Complaints

Patient Liaison Manager,
Complaints Office
Ninewells Hospital
Dundee
DD1 9SY

Tel: 0800 027 5507

CONSENT FORM**Factors affecting Quality of life in children with differing Body Mass Index.****Please initial in the box provide**

I have read and understood the Parent Information Sheet

I confirm that I have received enough information about this study

If no, did you contact the research team and were your questions answered to your satisfaction?

Do you understand that your child's participation is entirely voluntary

Do you understand that you child is free to withdraw from the study:

At any time

Without giving a reason

Without affecting his/her present or future care

Do you agree to your child taking part in this study

Name of person taking consent.....

Date.....

I am the parent/guardian of.....

...DOB.....

Primary School..... Home postcode.....
(optional)

Do you wish to be kept informed regarding the results of the study? Y / N

If 'yes', please enter your details below:

If you agree to your child's GP being contacted please enter the details below.

Name.....

GP Name.....

Address.....

GP Address.....

.....

.....

.....

.....

Post Code.....

Thank you for agreeing for your child to take part in this study. Your child's answers are confidential, and all data will be anonymised.

Appendix 10 - Participant Information Sheet, Clinic

Hi,

My name is Clare Hamilton



I am training to be a Clinical Psychologist at the University of Edinburgh and work for NHS Tayside.



I have to do a project as part of my training and invite you to take part in a study.

Before you say 'yes' or 'no' I want to tell you why the study is being done and what you would do if you take part.

Please read it carefully, or be sure that someone reads it to you. If there are any bits you do not understand, please ask questions.



What is the study about?

Lots of things affect how happy we are with our lives.



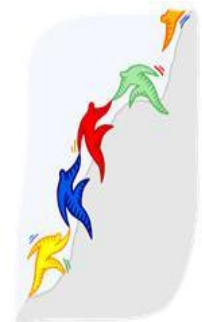
I want to know if height and weight,



the way you feel about yourself,



or the way you deal with situations, has an effect on your life.



The project has been checked by a special Committee to make sure you have all the information you need. This Committee is called a Research Ethics Committee



What will I be asked to do?

I will be asking you to answer some questions about

your hobbies,



and your screen time.



Then I will be asking you to fill in some questionnaires,



this should take about 30 minutes,



and will take place during POST.



I will be available to answer questions or you can ask POST.



Taking part in the study?

Your parent or guardian,



has said it is ok for you to take part in the study.

If you decide at any time you do not want to take part it is ok for you to say no.



You can tell me or one of the POST staff and you don't have to say why.

Deciding to take part or not will not affect your time with POST.



You can decide during the study you no longer want to take part,



And your details will be removed and destroyed

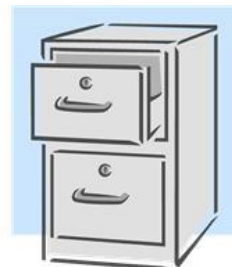


What will happen to my information

I (Clare Hamilton) will be the only one allowed to look at your answers.

They will be kept in a locked filing cabinet.

Your name will be removed from the questionnaires so no-one knows it's yours.



Will you find out the results of the study?

I can send a copy to your house.



I don't agree with the study- what should I do?

If you don't agree with any parts of this study and would like to make a complaint, you can do this through:

Phone- (0800 027 5507)



Write a letter- Send it to- Patient Liaison Manager,
Complaints Office,
Ninewells Hospital,
Dundee.
DD1 9SY.



Thank you for taking the time to read this.

If you agree to take part in the study please fill in the details below:

I _____ (Please write your name here)

Understand what the study is about YES/NO

Have been able to ask questions YES/NO

Understand I can leave the study at any time YES/NO

Would like to take part in the study YES/NO

SIGNED _____

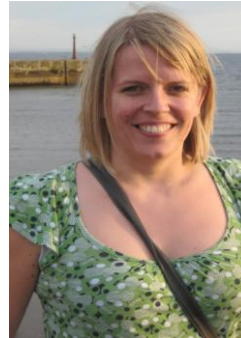
PLEASE PRINT NAME _____

DATE _____

Appendix 11 - Participant Information Sheet, School

Hi,

My name is Clare Hamilton



I am training to be a Clinical Psychologist at the University of Edinburgh and work for NHS Tayside.



I have to do a project as part of my training and invite you to take part in a study.

Before you say 'yes' or 'no' I want to tell you why the study is being done and what you would do if you take part.

Please read it carefully, or be sure that someone reads it to you. If there are any bits you do not understand, please ask questions.



What is the study about?

Lots of things affect how happy we are with our lives.



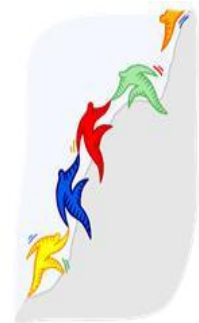
I want to know if height and weight,



the way you feel about yourself,



or the way you deal with situations, has an effect on your life.



The project has been checked by a special Committee to make sure you have all the information you need. This Committee is called a Research Ethics Committee



What will I be asked to do?

I will be asking you to answer some questions about

your hobbies,



and your screen time.



Then I will be asking you to fill in some questionnaires,



this should take about 30 minutes,



and will take place during school



I will be available to answer questions or you can ask your teacher.



Taking part in the study?

Your parent or guardian,



has said it is ok for you to take part in the study.

If you decide at any time you do not want to take part it is ok for you to say no.



You can tell me or one of your teachers and you don't have to say why.

Deciding to take part or not will not affect your time at school.



You can decide during the study you no longer want to take part,



And your details will be removed and destroyed



What will happen to my information

I (Clare Hamilton) will be the only one allowed to look at your answers.

They will be kept in a locked filing cabinet.



Your name will be removed from the questionnaires so no-one will know its yours.

Will you find out the results of the study?

If you want to know the results of the study
I can come back to your school and give a talk,



or I can send a copy to your house.



I don't agree with the study- what should I do?

If you don't agree with any parts of this study and would like to make a complaint, you can do this through:

Phone- (0800 027 5507)



Write a letter- Send it to- Patient Liaison Manager,
Complaints Office,
Ninewells Hospital,
Dundee.
DD1 9SY.



Thank you for taking the time to read this.

If you agree to take part in the study please fill in the details below:

I _____ (Please write your name here)

Understand what the study is about YES/NO

Have been able to ask questions YES/NO

Understand I can leave the study at any time YES/NO

Would like to take part in the study YES/NO

SIGNED _____

PLEASE PRINT NAME _____

DATE _____

Appendix 12 - Demographic Information

Information about you



Which school do you attend? _____

How old are you? _____

Are you male or female? _____

What are your hobbies? _____

Roughly how many hours per day do you watch TV? _____

Roughly how many hours per day do you spend on the computer (playing computer games, on the internet etc) _____

PLEASE FILL IN THE INFORMATION ABOVE, IF YOU DO NOT DO ANY OF THESE THINGS PLEASE ENTER A ZERO.

PLEASE ASK IF YOU HAVE ANY QUESTIONS.